

# AMERICAN RAILROAD JOURNAL, AND ADVOCATE OF INTERNAL IMPROVEMENTS

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D. K. MINOR, EDITOR.]

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## AMERICAN RAILROAD JOURNAL.

NEW-YORK, MARCH 26, 1836.

A gentleman of experience in Civil Engineering, is about visiting Europe for the purpose of examining the Railroads, Canals, and other works of internal improvement, and will remain there most of the ensuing year. It has occurred to us, that some of the numerous Railroad Companies, now preparing to commence operations, may find it for their interest to engage him to furnish information in relation to late improvements, and perhaps, to make contracts for iron, &c., for both of which duties he is every way competent.

Further information will be given on application to the Editor of this Journal.

AN ENGINEER who has had charge of several important works in the United States, and is now engaged upon one of a large class in a neighboring Province, is desirous of being employed during the ensuing six or eight months by some com-

pany, to make the preliminary surveys of a Railroad or Canal.

He can give the best of references.

Applications in relation to his employment may be made to the Editor of this Journal.

We ask attention to the article in this number from the Journal of the Franklin Institute, in relation to Avery's Rotary Engine—both to the strictures of *Fair Play?* and to the remarks of the Editor of the Journal in reply.

For the satisfaction of those who take an interest in the engine, we will endeavor soon to say something in relation to the one in use in this city.

A project is on foot at New-Orleans, for the construction of a Ship Canal of eight miles in length, to lead from the Mississippi to the ocean. It is to commence about three miles below Fort Jackson, passing through the prairie on the left bank of the river. The cost is estimated at \$300,000 to \$500,000.

We ask the attention of those who are, or desire to be, engaged in putting down the superstructure of Railroads, to the following notice to contractors from the Chief Engineer of the GEORGIA RAILROAD.

GEORGIA RAILROAD & BANKING COMPANY.

### NOTICE TO CONTRACTORS.

SEALED Proposals will be received at this office, between the 1st and 3d of June next, for laying the superstructure on 50 miles of the Georgia Railroad—all materials to be furnished by the Company.

The first ten miles to be commenced by the 10th of September, and completed by the 15th January next—the remainder of the line must be finished on or before the 1st of May, 1837.

Plans and Specifications of the work, may be seen, and all other information obtained on application at the office, one week previous to the letting.

J. EDGAR THOMSON, Chief Eng'r.  
Engineer's Office, Augusta, Geo.  
April, 2d, 1836.

We would call the attention of those of our readers, who engage in the construction of Railroads, to the following notice of Mr. Petrie, Engineer of the Jackson and Brandon Railroad Company in Mississippi.

### TO CONTRACTORS.

Sealed proposals for the graduation, bridging and superstructure of the JACKSON and BRANDON RAILROAD: for the erection of a BRIDGE over Pearl river, and the remaining incidental work necessary to the completion of said road, will be received at the Railroad Office in Jackson, until the 10th of May next.

Plans and specifications will be exhibited at the office, and the necessary explanations given, by the Assistant Engineer upon the line, one week previous to the letting.

It is expected that testimonials of characters, &c. will accompany the propositions of those who are not personally known to the Agent, and the Company reserve the right of rejecting any bids not deemed to their advantage.

W. PETRIE, Chief Eng. & Agent.

J. & B. R. & B. Co.

Jackson, Mi. March 15, 1836. 12—3t.

A TRIP TO BOSTON.—We were of the party which participated in the pleasure of an excursion, in the new and splendid steamboat Massachusetts, to Providence on Saturday the 2d April. The following account of the boat and her performance, from the New-York American, is all that need be said in relation to her; but of us more is required; we must refer also to those more recent and more useful works of art, RAILROADS.

"THE STEAMBOAT MASSACHUSETTS returned yesterday from her first trip, as one of the regular packets of the Boston and Providence Railroad line, having performed to the satisfaction of her owners, and to the admiration of numerous passengers, among whom the writer was one.

"We left herean Saturday at a little after 5 o'clock, and ran the distance to Providence in a little more than 13½ hours—with less perceptible motion, less vibration, and a greater sense of the solidity and security of the noble vessel, than usually attach to fast boats.

"The Massachusetts is of about 700 tons burthen: her cabin, which is one lofty saloon of some 300 feet or more in length, is fitted with three tiers of berths, and can



thus accommodate 115 passengers: the finishing is in good and simple taste, where every thing appears to have been done for comfort and use, and little for mere show: the bedding is excellent, and made for the boat,—the blankets and counterpanes being woven expressly for her, and having the name at length on each: the table service, of pure white, is marked on every piece with armorial bearings of the State of Massachusetts; and the order and regularity of the service of the table are exemplary.

"The upper deck presents an unobstructed walk of 200 feet; which, though rather uninviting in this cold and unseasonable weather, will make a delightful summer promenade, while below, and on a level with the ladies' cabin, the space may be inclosed, as from the severity of the cold it was on Wednesday night, and made a vast apartment.

"Of her speed sufficient is said, in noting the fact that her first trip was performed in considerably less than 14 hours; which, for a distance estimated at 200 miles, is fast enough.

"Returning, the steamboat *President*, not second before certainly to any boat on the sound, started from Providence six or seven minutes ahead of the *Massachusetts*, and a contest for superiority ensued—a generous emulation, truly, for there was no undue excitement, no impropriety, nor any unsafe exertion made on board the *Massachusetts*, certainly; nor, we may say, we are sure, with every presumption of truth, on board the *President*. The *Massachusetts* bore away the palm, overtaking the *President* first abreast of Newport—and subsequently (the *President* having first, by some minutes, got away from the dock,) in the Sound, and arrived here several miles in advance of her competitor, in something less than fourteen hours from Providence. Of her commander, Capt. Comstock, it is hardly necessary to say more, than that to no hands could be more worthily confided so fine a vessel and so responsible a command; he may be likened to the engines of his boat, working silently but very effectively.

"The *Rhode Island*, another boat of the same class, and belonging to the same Company, was launched in safety yesterday, and will take place in the line in June. A third, to be called the *Narragansett*, of equal force and dimensions, is building, and when completed, the three will present to passengers a combination of power, speed, comfort and safety, not equalled, probably, on any waters.

"These boats connect with the Railroad line, so that on their arrival a train for Boston proceeds immediately, bringing, in fact, the cities of New-York and Boston within easy and unfatigued travel of from 15 to 18 hours."

We arrived at Providence a few minutes before 7 A. M., where we found a locomotive, with a long train of cars, in readiness to take us to Boston. Taking our seats, and putting the train in motion required but a few moments, when the engine moved off in beautiful style, crossing the line of Rhode Island into Massachusetts, passed through a considerable cutting, and ascended an inclination of about — feet per mile.

We soon found that the past almost unparalleled severe winter had, in some measure, affected the Road. The cross ties, or sleepers had in many instances, sunk below their level, which caused more or less jolt-

ing as the train passed over them. This will, however, be remedied as soon as the frost is entirely out and the ground settled.

The location of this Road does credit to the Engineer—and it is for that which an Engineer is first and mainly responsible; after that, unless he has ample means at his command, his responsibility consists in properly appropriating that which he has.

This Road must become a great thoroughfare, and it must and certainly will be made permanent.

The general features of the Road are very favorable. It is 42 miles in length; more than one half of it is in a straight line; there is no grade exceeding  $37\frac{1}{2}$  feet per mile; and no curve with a less radius than 5000 feet. It is graded for two tracks—the first entire and a part of the second, is laid with the  $\perp$  rail weighing 56 lbs. to the yard—resting upon cross sleepers, which ought to, but do not, rest upon longitudinal sills beneath the surface of the earth—or upon a foundation of solid materials. The rails are fastened to the sleepers, by spikes with the head turned one way, forming a hook, which holds to the under lip of the rail.

The engines used are of English Manufacture, and weigh about eight and a half tons, and travel at from 10 to 30 miles per hour. A part of the country through which the Road passes is uninteresting, but that in the vicinity of Boston is beautiful.

The Canton viaduct is a stupendous work. It is creditable alike to him who projected and those who executed it. There are few equal to it in the country. It is 50 feet high and 450 feet in length, of solid masonry, and contains about 15,000 perches of solid masonry.

On our arrival in Boston we took quarters at the TREMONT; and it is no disparagement to any other house in our country, to say that its superior cannot be found in the Union. If any one doubts it let him go and spend a month or a week there, and satisfy himself.

On Monday we proceeded to Lowell—a distance of 25 miles—time of travelling ONE HOUR, by the Boston and Lowell Railroad. This is a work of uncommon firmness. The rail mostly used in the construction of the Road is what is usually termed the "fish-belly" rail, (see Vol. 1, No. 4, fig. 9, of the Railroad Journal,) in lengths of about 15 feet, but it is not approved of.

The second track will be laid, we were informed, with the  $\perp$  rail.

The stockholders of this Road are gentlemen of wealth, and most of them deeply interested in the town of Lowell, and therefore deemed it to be for their interest to make the work in the most permanent manner, that they might rely at all times upon it as a means of communication between the two cities of Boston and Lowell—they have succeeded—and may, in all time to come, and at all seasons of the year, with proper care, travel and transport over it at the rate of 26 miles per hour.

This Road has no grade exceeding 15 feet in the mile, and no curve with a less radius than 3,000 feet. The superstructure, if so it may be termed, consists of continuous stone walls with their foundation three feet and over below the surface, with cross ties or sleepers of stone, about  $3\frac{1}{2}$  from centre to centre, upon which are placed cast-iron chairs of about 17 lbs. weight—in which rests the fish-belly, edge rail, weighing 45 lbs. to the yard; but it is not liked—being found liable to break.

The engines used on this Road are of about  $8\frac{1}{2}$  tons weight, and are manufactured at the Manufacturing Company's splendid machine shop at Lowell, an establishment which is creditable to our country, and at which we are informed the entire machinery for a cotton factory of 5000 spindles may be supplied in four months—and in addition to which they are now nearly prepared to complete a locomotive engine every two weeks, is required.

We spent our time very pleasantly from 10 to 3 o'clock, in visiting the various factories, and in conversation with gentlemen connected with them, and were in Boston a few minutes after 4 P. M.—thus having travelled 52 miles and devoted five hours to useful observation and inquiry between 9 A. M. and 4 P. M.; a performance, the prediction of which, only ten years ago, would almost have caused the issuing of a writ of lunacy against him who dared be so bold.

For a more full and highly interesting account of Lowell, we refer our readers to the communication of our worthy correspondent, the Rev. Henry Colman, will appear in our next number.

Of the Boston and Worcester Railroad, which we intended to, but for other engagements did not, visit, we speak from the report of a practical engineer, Mr. James Seymour, who accompanied us over both the Boston and Providence, and the Boston and Lowell Roads.

The Boston and Worcester Railroad is 44 miles in length—its steepest grade is 35 feet per mile, and its shortest curve has a radius of 1140 feet; there is, however, a very small portion of the curved line with a less radius than 1600 or 1700 feet. The Road is graded for a double track, a single one only is laid. The superstructure consists of the edge or  $\perp$  rail, of 50 lbs. to the yard, placed in cast-iron chairs, upon wood cross ties or sleepers, which are covered with earth—thereby keeping them always moist, and of course less liable to decay.

This Road, like the Boston and Providence, has been considerably affected by the frost, during the past winter—they will, however, both be speedily put in first rate order for use, and must of course become great thoroughfares for travel and transportation. The Boston and Providence, at least for a time, for the direct communication with New-York, and the Boston and Worcester for that across the country and up the Valley of the Connecticut.



This last mentioned Road must, at no distant day, become one of the most profitable in the county. It will be the termination of no less than four important Roads, viz. the Norwich and Worcester; the Worcester, Hartford and New-Haven; the Western, or Worcester and Albany, with a branch to Hudson; and the Connecticut Valley Railroads—either of which, independent of the others, with its local business, would warrant the construction of a Road from Worcester to Boston.

A visit to, and examination of, these Railroads, will deeply impress upon the mind of the most casual observer the fact that *Bostonians* are resolved to omit no effort to open, upon the most improved plan, such avenues of communication as will insure to her, at all times, her full share of business. If any one doubts it, let him contemplate for a moment her position. A good harbor and the wide ocean on one side, with a Railroad to Providence, which will be extended to, or connected with one to Stonington—both connected with a first rate steamboat navigation; another to Worcester, which will be, in a few years, connected with a Road to Norwich, another to Hartford and New-Haven, a third to Albany and Hudson, and a fourth to and up the beautiful Valley of the Connecticut, at least to Canada line, and probably to Montreal—and a third to Lowell—which is by no means its termination, as it will probably be extended to Brattleborough, there intersecting one from Springfield, connected with the Worcester, the Hartford, and the Albany Roads—as it certainly will be continued to Concord and Lebanon, N. H., and to Montpelier and Burlington, Vt.—thus opening the way to all New-England, except in an easterly direction, which is to be effected by a Road recently surveyed through Salem, in the direction of Portsmouth, N. H., and Portland, Maine—and will be, beyond all question, connected with the contemplated Road to Quebec. With such evidences of enlightened forecast and public spirit in her citizens, who dare not predict for Boston a degree of prosperity and importance hitherto little anticipated.

With such evidences of public spirit before us, in a neighboring city and State, how great and mortifying the contrast when we review the policy of those who wield the destinies of this State!

#### NEW MODE OF JOINING THE PLATES OR BARS USED UPON RAILROADS.

To the Editor of the Railroad Journal:

Montgomery, Alabama, March 28th, 1836.

Sir,—Enclosed I send you five dollars—my amount of subscription for the current year.

I also send you a drawing of a new mode of joining the plates or bars used upon Railroads, together with an extract from the specification of a patent, applied for by me, for the same—which, should you think it

worthy a place, I should be pleased to see in the columns of your journal.

Very respectfully,

Yours, &c.

A. M. McCaune.



#### EXTRACT:

"The surface of the bar may be either rounded or flat—a plain plate, or flanged on the inner edge, or otherwise, as preferred, and of any required thickness, width, and length. The joint or connection, which I claim as new and original, I make with a double lap or bevel; that is to say, two bevels or laps in contrary directions, of equal or unequal width of surface on the end of each plate, in such manner that one part of the bar or plate laps *above*, or over, a part of the connecting bar or plate, while the other part falls *below*, or under a corresponding part of the same connecting bar.

"In the drawing, the bevel or lap is represented of equal widths upon the end of the plate, each bevel being made in contrary directions, at an angle of 45°, which angle may be found most advantageous in practice. And where greater solidity in the extremity of the joint is required, instead of a plane surface, or "bevel," I use a convex and corresponding concave surface—the point, or centre, from which said curved surface is described, being upon the upper edge of the plate or bar.

"The bevels or laps are of the same width and angle on the connecting plate, but inverted in position, so as to make a perfect joint both laterally and longitudinally, when applied to the preceding plate: so that all the plates having the ends thus bevelled or lapped, and laid down continuously upon the bearing surface, may be confined down by one spike in the centre of each bar or plate; and it is evident that the plates or bars may be permanently fixed with a fewer number of spikes than is necessary with the ordinary methods of joining.

"I also claim the application of this principle of the double lap or bevel, to a *mitre* joint and *tongue* joint, or to any other joint by which the bars thus *confine* each other, when placed in connection.

"Any one at all acquainted with the practical operation of Railroads, must at

once appreciate the advantages of this expedient, by which the subscriber conceives they may be effectually secured from all difficulties arising from the working loose of the end spikes, and consequent rising of the extremities of the plates—which coming in collision with the wheels and axles of the engines and cars, give rise to serious accidents, endangering the lives of passengers, and causing frequent and expensive damages to the locomotives.

"With this joint, even should the end spikes work out, or break off, there can be no vertical or lateral separation of one bar from another—and, consequently, no injury can arise from such cause. The great and perpetual expense attending the keeping up of supervisors of the iron, on a long line of Railroad—now found absolutely necessary to prevent injuries and accidents from loose bars—would be entirely obviated. A great saving in the annual expenses of the road would be thus effected; and the trips could be performed with more celerity and regularity, and the passengers would pass over the road without that constant apprehension of danger, which the prospect of loose bars, broken spikes, and raised plates, is so well calculated to awaken."

I approve very highly of the above plan of joining rail plates, and shall adopt the same on the Montgomery Railroad.

ANDR. ALFRED DEXTER,

Civil Engineer.

March 28, 1836.

#### RAILROADS IN GEORGIA.

There can be little doubt, we should think, of success to any judicious, managing man, who will engage in the business spoken of in the following communication.

For the Railroad Journal.

Mr. Editor,—I find your Journal abounds with communications on the subject of Internal Improvements, particularly Railroads. Permit me, through your columns, to say, that description of improvements has commenced in Georgia. The Central Railroad and Banking Company has lately organized, and will no doubt proceed forthwith to the work of a Road from Savannah to this city, two hundred miles in length. The Monroe Railroad Company is now progressing with their Road from this place to Forsyth, twenty-five miles, through the healthiest part of Georgia; the water is pure freestone, and the atmosphere of the purest and best; the survey is progressing under Messrs. Tomson and Griffin, from Pennsylvania, and will in a few months be completed and ready for contract. Northern contractors would do well to turn their attention this way, as the field is large and just opening, and competition almost none. Stock will be offered the 1st of November next, for a continuation of the road from Forsyth to



West Point—say 85 miles—there to unite with the road now in progress from Montgomery, Alabama—say 90 miles. The whole length of all these roads from Savannah to the latter place will be four hundred miles.

Our city is central in the State, and will receive this season eighty thousand bales of cotton—an increase over last year of twenty thousand, and a prospect of a further increase. Under all the circumstances it seems to me a most favorable location for a foundry and factory for Railroad and engine apparatus; the northern cities are full to over-running, and here nothing of the kind doing; and the whole country fully ripe for the harvest. All the engineers in this country are from the northern climate, and will bear me out in saying, that from the middle section of the State upwards, is as pleasant and as healthy as in any part of the United States. We have here to this place steamboat navigation, one steam mill in operation, and another building. The excavation and embankment on the Monroe Railroad is almost entirely earth, but part heavy for this country. This city, in point of population and commerce, is now improving at the ratio of seventy-five per cent. per annum.

L. L. GRIFFIN.

Macon, March 30th, 1836.

#### RADII OF CURVES, ACCLIVITY OF GRADES, RATES OF SPEED, ETC.

To the Editor of the Railroad Journal:

Sir,—It was not until very recently, that I discovered in your Journal of February 13th, a communication signed S. D., in relation to the report of James Seymour, respecting the radii of curves, acclivity of grades, rates of speed, &c., of the different Railroads between Washington and New-York, and the Roads in the vicinity of the latter city. I entirely agree with S. D. in saying that the natural features of the country must govern the course of the route, nor would I be understood to say that the radii of curves were no detriment to such a work as the New-York and Erie Railroad; but on the contrary, I consider these things serious obstacles in the way of Internal Improvement, and might be carried to such an extent as to work a complete failure of the purposes intended by them. If the surface should prove to be a perfect plane, as S. D. says, I confess there would be but little to contend against, and in such case the service of an engineer would hardly be required. But he admits that this is not often the case, and that the surface is more or less broken—that the topography of the country is undulating, with vallies and ridges often running contrary to the course that we would wish them. It is frequently the case that spurs run out so that engineers are obliged to cut through them, and place the earth in the vallies or low ground contiguous. This, of course, must enhance

the expense, yet it is often better to do this than to curve around them, if the radius is likely to be short, and the grades light. But where the curves can be made with a large radii, and the grades are heavy, engineers should, by all means, avoid these jutting points by curving around them. This increases the distance, but this objection is overbalanced by lessening the cost, and also lessening the grades. This engineers are often compelled to do in this country, and on the route of the New-York and Erie Railroad, great pains have been taken to avoid curves of small radii, so much so that in many instances the expense has been greatly increased to effect this object. Speaking for myself, I have not located one foot of ground with a radius of less than 955 feet, and think to have one continued line of over 60 miles with a curve of no less radius, although with a radius of from 400 to 600 feet, I could have wound round hills, and kept the grade near the surface, whilst, with the radius of 955 feet, the grade line must often pass so as to make the cutting much greater and the embankment much more heavy.

Equal pains have also been taken to lessen the grades by keeping well upon the side hills,—by crossing deep ravines,—and by causing excavations of ten, fifteen, twenty, and sometimes over thirty feet,—whilst, if a sharp grade were no detriment, we could follow near the streams, and would lessen the expense; but the grades in these instances, would, at times, be quite easy, and in other places very heavy. The engineers have chosen and acted upon the course of making the grades as regular as possible,—which course will stand the test of review. Knowing, or at least believing, that many will view this magnificent work (the largest and most noble of the kind in the United States,) its engineers would in all time to come, regret that it should not be completed in a workmanlike manner, or that permanent injury should result to the Company or the public, from their incapacity, especially with one so eminent in his profession as Judge Wright at the head.

As S. D. says his motive in adverting to Mr. Seymour's letter, is a desire to see the Lake Erie Railroad finished, as regards route and details, as perfect as circumstances will permit, the Company are doubtless obliged to him for his friendly feeling towards their Road, and in behalf of the Engineers I invite him to an inspection of the same as soon as they shall have so much of it completed as he may consider worthy his attention.

ONE OF THE ENGINEER CORPS OF THE  
NEW-YORK AND ERIE RAILROAD.

#### QUERIES.

We shall be obliged to any one who will answer the following queries, both to oblige the gentleman who inquires, and for our own gratification:

"I saw, perhaps two years since, a notice

of a machine (in the Railroad Journal,) for making bricks by pressure, so that when they came out of the mould, they were ready to go into the kiln. If you know any thing about the practical success of the machine, please give it in the Journal. Have the bricks been found on the whole to be better than those made in the common way?"

#### AVERY'S ROTARY ENGINE.

We give the following communication from the pen of a friend who should have been an ENGINEER, rather than of that profession heretofore considered almost the only path to eminence, the Law.

To the Editor of the Railroad Journal:

SIR,—It is some time since the attention of the public has been invited, through your valuable Journal, to the Re-acting Rotary Engine of Mr. Avery, of Syracuse, but the merits of the invention do not seem to be duly appreciated, except, perhaps, by those who have an engine of his construction in actual use. I have been informed, however, that in every instance where one of this kind of engines has been put up, it has proved itself superior to the high pressure piston engine. It is quite probable that most engineers have fallen into an error in theory in calculating upon the power of Mr. Avery's engine, by misapplying one of the first principles of mechanics—"that action and re-action are equal." Starting with this theorem, which is admitted to be true, one would very readily be led into an erroneous conclusion by reasoning in this manner:—"Action and re-action being equal, and the most that can be obtained by a fluid impinging upon the vanes of a wheel, is an effect equal to one third of the power applied, therefore the effect in the re-acting engine is only one third of the power of the steam used," from which must be deducted the usual discount for friction, &c. This conclusion is plausible, but erroneous, as can be shown by comparing the different circumstances under which the power is applied in the two cases. In the case of a fluid impinging by direct action upon vanes or paddles, if any motion whatever is produced, the vanes must necessarily move in the same direction with the impelling fluid, and the velocity of this motion must be deducted from that of the stream, so that the greater the velocity of the wheel the less is the impulse. In the reacting engine there is no loss from this source. The motion may be greater or less, and not affect the impelling pressure, because the power moves with the revolving arms, and whatever may be their velocity the enclosed steam and those arms are relatively at rest, and the pressure upon the side opposite the orifice is precisely the same when in the most rapid motion as when standing still.

It is upon this principle that the rocket ascends with astonishing velocity, the re-acting pressure not being in the least diminished by the ascending motion.



If I am correct in the rationale of the reacting engine, we need not be surprised that it should perform at least as much with the same fuel as the common high pressure engine, which at best falls far short of the actual initial power of the steam employed.

HIERO.

REMARKS AND INQUIRIES RESPECTING MR.

EVERY'S PATENT STEAM ENGINE.

To the Editor of the Journal of the Franklin Institute.

Sir,—You have doubtless seen, in a late number of the New-York Mechanics' Magazine, (the one for September, I think,) an engraved drawing of "Avery's Rotary Steam Engine," accompanied by a description. It is generally believed that this engine has been secured to Mr. Avery by patent. I have always supposed the main object of the patent law to be, the protection of original inventors in the enjoyment of whatever pecuniary advantages they may fairly derive from their useful inventions.

That Mr. Avery's engine, or one constructed upon the same principle of action, though perhaps somewhat different in detail, will be found in some situations a convenient and economical machine, I do not doubt. Indeed, I know some persons who would like to make use of such engines, but who are, some of them, unable, and all unwilling, to pay Mr. Avery for the privilege of doing that which they feel themselves equally at liberty to do with himself. My reasons for doubting the validity of his patent, may be found, first, by referring to the September number of the New-York Mechanics' Magazine for 1833, in which is given a drawing and description of the beautiful contrivance of Hiero, the first account of which is said to have been published in the year 1571.

The principle upon which Mr. Avery's engine acts, will, I think, be seen at a glance, to be the same as that of Hiero's. Secondly, in a work by Oliver Evans, entitled the "Young Steam Engineer's Guide," published by Carey & Lea, page 93, the biographer of Mr. Watt, speaking of his first attempt to produce a direct circular motion by steam, says, "he (that is, Mr. Watt) then tried Parent's or Dr. Barker's Mill,\* inclosing the arms in a metal drum which was immersed in cold water; the steam rushed rapidly along the pipe which was the axis, and it was hoped that a great reaction would have been exerted at the ends of the arms, but it was almost nothing, the reason seems to be that the greatest part of the steam was condensed in the cold arms. It was then tried in a drum kept boiling hot, but the impulse was now very small in comparison with the expense of steam." Upon this experiment Mr. Evans remarked as follows: "It is evident, from this account, that Mr. Watt has used weak steam, and placed dependance on the use of a condenser; had he in his experiment with Doctor Barker's Mill, lessened the apertures by which the steam issued, so as to confine the steam until the power in the boiler was equal to 100 lbs. to the inch, he would have been astonished to see it revolve about 1000 times a minute, supposing the rotary tube to have been three feet in length; I have tried the same experiment, but without the least hope of success, on

any other principle than by confining the steam to increase its elasticity to a great degree. My rotary tube was three feet long, the elastic power of the steam about 56 lbs. to the inch; it revolved with a velocity of about 700 to 1000 times a minute. The aperture by which the steam issued about  $\frac{1}{2}$  of an inch in diameter; it exerted more than the power of two men, and would answer to turn lathes, grindstones, &c., when fuel is cheap. I have specified and explained it in the Patent Office." Unfortunately, there is no date to this work of Mr. Evans, but I presume it can be readily ascertained in Philadelphia, when it was published, and probably when the specifications were entered at the Patent Office. But that it was done long before Mr. Avery's engine was thought of, I think there can be little room for doubt, as it appears from another part of the same work of Mr. Evans, page 96, that he matured his experiments upon the application of steam to a wheel, in the year 1784, which, as he states, he described in the Patent Office.

Under these circumstances, I cannot see what possible claim Mr. Avery can have to a patent for this invention; as to the drum which incloses the arms as represented in the drawing of his engine before referred to, I understand it is claimed as having been first applied to it, by a Mr. Clark, of some western town in this State.

By giving the foregoing an early insertion in your Magazine, you will, sir, essentially oblige several of the friends and readers as well as promote the cause of justice. Should you be willing to express your own opinion as to the merits of this question, it would be deemed particularly valuable.

FAIR PLAY.

Remarks on the foregoing communication, by the Editor.

It so happens that "Fair Play," and others, who desire information on the subject of Foster and Avery's Re-acting Steam Engine, (commonly called Avery's) will, in the present number, have a full opportunity of seeing what constitutes the claim of these gentlemen to a patent for an improvement in this machine. They were fully informed respecting what had been attempted with engines similar in construction to their own, previously to their obtaining a patent; and it will be seen that they have confined their claim to improvement within very narrow limits, and so far as we are informed, their claim is a valid one. It may be said that their improvement is trifling; that, however, is their own concern, as those who do not need it are at full liberty to use the machine in any of the various forms which had been previously given to it, or to devise others which are new, without buying from them what may be deemed unimportant.

We are not sufficiently well informed respecting the comparative results obtained from Avery's and the reciprocating, or Avery's and other rotary engines, to make up our minds respecting its real value; between four and five years, however, have elapsed since this engine was patented, and it has been at work at Syracuse, and various other places, during the whole of that time, so that those who have seen it, and who possess a competent knowledge of the subject, have had time enough to investigate it. Before the patent was obtained, we expressed to Mr. Avery, our general want of confidence in the real value of such engines, and our doubts respecting the importance of the improvements claimed; and we did not suppose that the career of the

one in question would extend to two years; a length of life, greater than has usually fallen to the lot of rotary engines; it still lives, however, manure our anticipations, and all the reports which we have received relating to it, tend to show that it has not yet exhibited the first symptoms of decline. Although we still adhere to the opinion, that upon a full comparison, the economy of a good reciprocating, will be greater than that of any rotary engine that has been, or will hereafter be, made, we most cheerfully confess that we have a much better opinion of Mr. Avery's, than we at first entertained; and, as to our wishes, they are that, by the operation of this, and a hundred other contrivances, which we have esteemed of like value, we may be put entirely in the wrong; let the fact be well established, and we would be the first to make it public. Without putting in an undue claim to the *suaviter in modo*; we have sometimes thought that the tendency of our animadversions upon patented inventions was to place us in the situation of "The best good-natured man, with the worst ill-natured muse;" it must be recollected, however, that we stand between the claimants of exclusive privileges and the public.

With respect to the amount of novelty necessary to security, as a foundation for a patent, we think that the fair test of this is the utility of the improvement; if it renders that valuable which was of little comparative worth, it is enough, although it be no more than the addition of a screw, or of a peg. The views which we have adopted upon this subject, may be found at large in Vol. 8, p. 411 of this Journal. The article is a borrowed one, and well worth perusal. "The main object of the patent law is the protection of original inventors in the enjoyment of whatever pecuniary advantages they may fairly derive from their useful inventions," and in attaining this end, it is not possible to test them by comparative weights, or to measure them by any established scale; absolute quantity, however small, is all that can be required.

DECISION OF THE CIRCUIT COURT OF THE UNITED STATES, FOR THE EASTERN DISTRICT OF NEW-YORK, IN A PATENT CASE INVOLVING SOME IMPORTANT PRINCIPLES. TO WHICH IS APPENDED SOME REMARKS BY THE EDITOR.

UNITED STATES CIRCUIT COURT.

BEFORE JUDGE THOMPSON.

Henry Stanley vs. Henry Hewitt.

This was an action founded upon a patent granted to the plaintiff, Henry Stanley, by the United States, the 17th December, 1832, upon a specification and application made to the patent office the 11th of October, 1832, for an improved rotary cooking stove. The plaintiff, by several witnesses, proved the originality of the invention in him, its importance and usefulness, and that the defendant had, from patterns taken from the plaintiff's stove, made and caused to be made, and sold a large number of stoves, and was still pursuing the business. The defendant, to show that the plaintiff's patent was void, called Elisha Town and his son, and others, to prove that in 1823 and 1824, he invented, and procured to be cast, a rotary stove, and that the plaintiff's stove revolved like it—also a Mr. Gould, to prove that the plaintiff took the collars and flues in the cap of his stove from said Gould's stove, and also other witnesses to show that the plaintiff, as well as others,

\* Descriptions of Barker's Mill may be found by your readers, in Ferguson's Lectures, Nicholson's Operative Mechanic, and almost every reputable work on Mechanics now in use.



had used the collars and flues long before the plaintiff's improved cooking stove was invented; and also, that the defendant attempted to show that the plaintiff had sold his stoves, and given his invention to the public before he applied for his patent.

The plaintiff, in reply, called numerous witnesses to show that Town's stove, whatever it was, was useless, and had been abandoned as such; and that the plaintiff had no knowledge of it when he made his invention and improvement, and that his stove, in all the important improvements by him claimed, was wholly unlike Town's stove, and that collars and flues were not claimed by him as his invention, independently of his rotary plate in which they were attached, and that when they were put upon the Gould stove, it was done at the plaintiff's suggestion. And that all the stoves delivered out before the application for the patent, were delivered to be used on trial, and with a view to test the utility of its improvements. The trial was a very labored one, and occupied five or six days; but finally resulted in a question of law, growing out of the wording of the specification; which appeared to have been drawn up by the plaintiff without proper legal advice.

On the part of the plaintiff, it was insisted that the claim, in his summary, was for a combination of certain improvements he had made in the cooking stove, connected together and attached to the top or cap of his stove, put in motion; and that it was the combination which he claimed, and not the parts forming the combination separately, and that his specification would bear that construction.

On the part of the defendant, it was insisted that the plaintiff had so worded his specification, that it would not bear that construction, and that it really claimed the different parts comprising the top or cap of the stove separately, and independently of any combination, and that his specification was otherwise defective.

Judge Thompson, in the progress of the cause, gave his opinion that putting the stoves out on trial, and for the purpose of experiment and improvement, was not such a public use of them as would be considered as a dedication to the public—that the plaintiff was justified and had a right to test the utility of his invention, and see what improvements might be made before he applied for his patent, and that this was an article which would be tested by being put into several families, where it might be differently used by different housekeepers.

In charging the jury, Judge Thompson, after stating the case and the difficulties arising from the obscurity of the language employed in the summary of the specification, remarked that in all cases, where consequences of great importance to the parties were involved, the jury must expect that the views of each would be presented with great earnestness and zeal. Nor is it surprising (said he) that in such controversies, matters not materially connected with the merits of the issue, should be brought before the Court and Jury during the progress of the trial.

These remarks are applicable to the case now under consideration. It evidently involves matters of importance to the parties concerned, and has been accompanied by circumstances having no material bearing upon the questions in issue. We, however, are to examine the controversy, and determine it, by the law and the evidence, without reference to extrinsic matters, having

no bearing upon its merits. And in this view of the subject, it is of no consequence whether the plaintiff, Mr. Stanley, has, or has not, accumulated a fortune, as the fruits of his invention. If, by his own talents, industry, and perseverance, he has produced a machine, useful in itself, and approved of by the public, he is entitled to the protection of the law, so far as he has rights to be preserved and guarded. And if, on the other hand, he has interposed claims which cannot be the subject of legal sanction, he must abide by the consequences of his fault, or misfortune.

I state to you, gentlemen, in the outset, that this is not a case free from difficulties. But I have the consolation of knowing that my decision of the matter need not be final, and that any mistakes committed here, may be reviewed and corrected by another tribunal, where I, too, shall have an opportunity of considering the subject with more care.

In my view of the case, much evidence has been introduced upon both sides, which is entirely irrelevant. The plaintiff's rights, whatever they are, depend upon his patent, and if he has any by his patent, and has not abandoned them to the public, he is entitled to protection. I confess to you, that my own prepossessions lean towards useful improvements, and I would construe the patent act with a liberal spirit, and expanded views. It is a beneficial law, having its foundations in public policy. Its object is, to encourage the enterprise of ingenious men, that the results of their labors, being brought into view, may be first enjoyed by the inventors for a limited period, and then dedicated to the public benefit forever afterwards. Nevertheless, I do not mean to say that all patents are to be protected at all events, but those only are to be sustained which have the sanction of law. It is a well known fact that patents are granted at the Patent Office, not after an examination into their merits, but upon *ex parte* statements, and hence their real claims may be afterwards investigated with proper strictness in a court of law.

There are some general rules always to be observed while considering this subject. In the first place, to entitle a patentee to maintain an action for a supposed violation of his rights, his invention must be both useful and new; not that its usefulness is to be scanned with a critical eye, to ascertain a given amount of benefit to be derived from it, but the invention must be useful, as contradistinguished from that which is frivolous, or wholly worthless. If not frivolous, or entirely useless, the requirements of the law in this particular are complied with.

With regard to the invention before us, it is clearly useful; this is proved by the testimony of witnesses on all sides. It is proved, also, by the great extent of the plaintiff's sales, by the favor of the public, which has been liberally bestowed upon it, and by the palpable imitations of the plaintiff's models in the case under consideration.

If the plaintiff has legal rights here, there can be no doubt that they have been violated by the defendant. There is no substantial difference between the stove made by the defendant, and that invented by the plaintiff; the one is a copy of the other. And as to the extent of the violations, there is as little doubt. If you believe the testimony of Mr. Randal, the defendant sold a hundred stoves before the commencement of this suit, if his own declarations are to be credited, for he told the witness, in express terms, not only that a hundred stoves like these had been sold in Vermont, but that

they had been sold by him. If this witness, therefore, is worthy of credit, (and he stands entirely unimpeached in every respect,) there can be no doubt that the plaintiff's right have been violated by the defendant, if, in fact, it shall appear that he has any which the law can protect.

But the great question is, whether he has any such rights, and the solution of that question is to be found in the patent itself.

And here I may remark, that much has been proved and said in relation to the inventions of Town and Gould. The evidence upon these points is only important in one point of view, and in that it will be here considered. It shows that the materials, or component parts, of Stanley's stove are not in themselves new; and if the plaintiff claims a combination of things, he has evidently taken old materials to form his machine with, whatever it may be.

In relation to this part of the case, I would observe, that the particular words used in the specification and summary of this patent are of no importance. The office of words is to convey ideas, and our province is to determine what the party intended to express by the language employed. Did the patentee intend to claim the discovery of a principle, in the abstract or philosophical sense of that term? or did he intend to describe a contrivance, or machine, new and useful in reference to the purpose for which it was produced? He claims in his summary, "the revolving top plate," as a constituent part of his invention, and the first inquiry is, whether, before the use of Stanley's stove, a contrivance had been used by which the utensils to be heated had been brought over the fire, by means of a top revolving upon its centre. If the patentee claims this revolving motion as his own discovery, in its application to a cooking stove, he evidently includes in his patent that which is not his own discovery; for Town's stove had a revolving top, or drum, intended to accomplish the same object, by means somewhat similar.

It is very possible that Town could not maintain a patent for that invention, because he long ago gave it up, and abandoned it to the public. He did not, however, abandon it to the plaintiff, and all other persons might use it as well as he. If Town's discovery was abandoned, the only claim to it which Stanley can maintain, is the use of the thing as a part of his combination; and here we must determine what Town's invention was.

It is evident that he invented a revolving drum or top of a stove, to convey vessels to and from the fire by a rotary motion, and concentrate the heat around them when placed there. This contrivance he gave up, or abandoned, because it was useless, that is, useless in its then combination, though not in the abstract—for the principle or contrivance, as to the revolution, remains. As a cooking machine, the stove of Town was good for nothing; but its revolving motion might be made useful when brought in connexion with other constituents properly adapted to the objects in view.

The same remarks are applicable to the raised cones, or collars, and the flues. Each of these was old, and each had before been used either by itself or in other combinations. Stanley himself had used the collars in his own stove, as far back as the year 1828. So had Wilson—and this part of the machine is confessedly old. So with regard to the flues. If Stanley was the inventor of these, he had abandoned them to the public long before the date of his patent, and he cannot, therefore, now claim them



as the subject of a patent. But the question is, whether Stanley does claim these materials or constituents as his invention?—for if he does his patent is void. He would then claim as his own the discoveries of others, or endeavor to maintain that which he had, by use, dedicated to the public.

If, on the other hand, the patentee claims a combination here, and nothing more, then I have no hesitation in saying that his rights are secured. If he goes for the elements or constituents of his machine, his patent is void, but if he merely claims a new combination of old materials, his rights may be protected. The patent itself is somewhat obscurely drawn, but the invention is useful and meritorious, and I am disposed to give it all the protection which the law will allow. A liberal construction should be given to these instruments, nor should a severe criticism be bestowed upon language used, for the most part by the inventors themselves, who are, in many cases, altogether unskilled in the use of technical terms. We are always to ask ourselves on these occasions, what was the intention of the writers, and if that be discovered, the particular words used are altogether unimportant.

With these views, and under these considerations, I proceed now to give you my notions as to what this patent contains. It concludes with a summary in the following words:—"the principle for which I claim the invention, and for which I ask letters patent," is "the revolving top plate or fixture into or on which are placed the principal utensils used in cooking," &c.

By the patent law, the party is required to describe that which he makes, that the public may understand the thing, and be able to construct the like after the patent shall have expired; and hence there is a necessity for a proper observance of this requirement of the act. In this case, the plaintiff claims the specific thing set forth in the summary, and we must turn to the specification in order to understand what that thing is. The term used in the summary is "principle," but a reasonable interpretation must be given to it, or no sensible exposition of the parties' meaning can be obtained. He evidently did not intend to claim the discovery of an abstract thing, or entity, but some tangible mechanical contrivance, described in the specification. By "principle," he evidently intended a contrivance or thing described; and as there is no magic in words, we may fairly give this interpretation to the term used.

The plaintiff then patents this "revolving top plate," with its collars and flues, but instead of describing his invention as it really is, a combination, he describes the constituent parts. His improvement consists of a combination, and he should so have described it, and I have no doubt that a specification may be drawn which will secure all his rights. If the plaintiff had properly described his invention as it actually exists, his patent would have been good, for then the combination would have appeared.

#### RAILROAD AND CANAL INTELLIGENCE.

##### BOSTON AND PROVIDENCE RAILROAD AND STEAMBOATS.

We find from the eastern papers that since the commencement of the travel this spring, every arrangement calculated to give satisfaction to the public has been

made. The regulations upon this road are such as to obtain credit from all parties. In connexion with this road are to be found several of the finest and most comfortable sails upon our waters.

##### NEW-YORK.

**Tunnel under the Hudson River.**—The bill to incorporate the Albany Tunnel Company, has passed both branches of the Legislature, and become a law; the amendments of the House having been finally, and very satisfactorily disposed of yesterday.

The bill provides that the Tunnel, for a distance of 300 feet from and east of the pier, shall be twelve feet below the lowest low water mark, as defined by the United States survey; and that the crown of the arch shall be eighteen inches below the bed of the river. It will of course pass, by a gradual elevation, from the place of the greatest depth, to the shore at either termination. The clear inner width of the Tunnel will be about 24 feet, and the height 12 feet. The site is of course not yet decided upon; but the general impression seems to be that its entrance into Market-street will be through Maiden-lane, which, having been recently widened, is admirably adapted to the purpose.

The directors named in the bill are Joel B. Nott, Stephen Van Rensselaer, jr., James Stevenson, James Vanderpoel and John Townsend.

Facts and estimates, we have reason to believe, will soon be presented to the public, showing its entire practicability, at an expense that will warrant the undertaking, upon a scale commensurate with the magnitude and importance of the object.

This is one of the greatest and most valuable charters ever granted by the Legislature of this State. It is also one of the most liberal. It is in perpetuity, and without a reservation of the power to modify or repeal. Very liberal time is granted also in relation to the period of completion. Upon the whole, the passage of this bill may be regarded as a measure of the highest importance to the company.

It is due to the representatives of the city of Troy, to say that their course in relation to the progress of the bill, has been characterized by great liberality; and that, notwithstanding the supposed rivalry existing between the two cities in some respects, they promptly and honorably facilitated its passage.—[Argus.]

##### NEW-JERSEY.

A Railroad is about to be constructed between Burlington and Mount Holly. The charter authorises \$70,000 stock; the estimated cost is \$35,000 for the seven miles of road.

The ground is said to be very favorable, no inequalities of consequence occurring on the line.

The money received by the stage owners on this line for passengers only amounted to \$3,100 for the last year. This alone will pay more than 6 per cent., without taking into account the transportation of goods.

##### PENNSYLVANIA.

A number of the laborers on the Susquehanna Railroad having struck for higher wages, and evinced a disposition to interfere with those who continued at work, it

was found necessary to despatch a company of the fine Volunteer Militia of this city to quell the disturbance. Three of the ring-leaders were arrested, brought to the city and put in confinement to answer for the offence. No further difficulty is apprehended.

##### VIRGINIA.

Richmond, March 29.

Travelling facilities are now complete from this city in every direction. The Railway cars set out daily for the Rappahannock river, on the Fredericksburg route, and the steamboat Thomas Jefferson leaves here every Sunday, Wednesday, and Friday, for Norfolk, connecting with the bay boats, for Baltimore and Washington. The brightening weather and the spring business will soon give an impulse to locomotion.

**Expedition between Richmond and New-York.**—We understand that the President and Directors of the Richmond, Fredericksburg and Potomac Railroad Company, are making arrangements which will enable travellers leaving New-York in the morning, to be in Richmond the next day to dinner; and on the other hand, will enable them to leave Richmond after breakfast and be in New-York the next evening.

It is anticipated that a line leaving New-York in the morning, will come to Philadelphia, and then reach Baltimore about eight in the evening; that after the arrival of the line at Baltimore, a train of cars will leave that city for Washington, and arrive in the latter place about eleven; that the steamboat will then leave Washington for Potomac Creek, and by means of the connection with the stages and Railroad, travellers will get to Richmond at the time above mentioned.

So travellers leaving Richmond after breakfast will get to Washington by three next morning, thence to Baltimore by six, and to New-York in the evening.

Under this arrangement a person leaving Richmond between breakfast and dinner would reach New-York as soon as the mail which should have left Richmond the previous evening, that is, if the hours for the mail should remain unchanged.—[Compiler.]

##### GEORGIA.

The following gentlemen have been elected Directors of the Central Railroad and Banking Company of Georgia, for the office at Macon.

J. COWLES,  
J. GODDARD,  
R. COLLINS,  
D. RALSTON,  
F. H. WELMAN,  
WM. SOLOMON,  
R. A. BEALL.

##### OHIO.

List of Acts passed at the last Session of the General Assembly.—General State Improvements by Canal or Slackwater.

To provide for the extension and completion of the Miami Canal north of Dayton; to improve the navigation of the Muskingum river; to provide for the construction of the Hoosier Canal; to improve the navigation of Willis' Creek; 18



prove the navigation of the Walhonding and Mohican waters; to provide for the completion of the Warren County Canal, and the adjustment of the claims of the company.

**To Incorporate Companies.—To Construct the following Railroads.**

The Chillicothe and Cincinnati Railroad; the Fort Wayne and Piqua Railroad; the Ohio, Maumi and Wabash Railroad; the Vermillion and Birmingham Railroad; the Ashtabula, Warren, and East Liverpool Railroad; the Cuyahoga and Erie Railroad; the Hanging rock and Lawrence Furnance Railroad; the Cleveland and Warren Railroad; the Toledo and Sandusky Railroad; the Ohio Railroad; the Columbus, Delaware, Marion and Upper Sandusky Railroad; the Cleveland and Pittsburgh Railroad; the Columbus, London and Springfield Railroad; the Newark and Mt. Vernon Railroad; the Mansfield and New-Haven Railroad; the Bridgeport Cadiz, and Sandusky Railroad; the Cuyahoga Falls Branch Railroad; the Circleville, Washington, Wilmington and Cincinnati Railroad; the Maumee and Kalamazoo Railroad; the Wellsville and Fairport Railroad; the Melmore and Republic Railroad; the Cincinnati and Western Railroad; the Little Miami Railroad; the Muskingum and Columbus Railroad; the New-Haven and Monroeville Railroad; the Akron and Perrysburgh Railroad; the Urbana and Columbus Railroad; the Columbus and Marysville Railroad; the Stillwater and Maumee Railroad; the Conneaut and Beaver Railroad; the Cleveland, Columbus and Cincinnati Railroad.

**To Construct the following Canals.**

The Franklin Canal; the Sandusky Canal and Slackwater; the Chippeway Canal; the Belleville and Bolivar Canal; the Mt. Vernon Lateral Canal.

**FLORIDA.**

The Railroad from Bayou Columbus to this place, is now completed, or is so far done, as to enable Cars to cross from one depot to the other, and is open for the transportation of merchandise.

Heavy shipments of goods have been ordered from New-York, New-Orleans, and elsewhere to this city, by the interior merchants, and contrary to the expectations of many, it is now well ascertained, that most of the spring and summer business will be transacted here.

We also learn that the steamers Reindeer, Hiperion, and several others on the river, are to commence their trips from the depot to Columbus in a few days, and will discontinue their trips to Appalachicola entirely. This Railroad was the last one chartered by the Legislative Council, and is the first in operation in the Territory. The enterprise has proved, entirely successful, and there is nothing in human power that can destroy its prosperity and future greatness. —[St. Joseph's Telegraph.]

**MISSOURI.**

St. Louis, March 8, 1836.

The Railroad meeting on Saturday last was composed of the most substantial class of our citizens—those who have the capital, and in whom the disposition exists, to forward the work without delay. Another project received the attention of the meeting, which is of great interest to our city, and if successfully entertained will make it one of the greatest manufacturing and com-

mercial places in the Union. We mean the projected Railroad to the lead mines of Washington and Franklin Counties, and iron mines in the same region of country, and eventually extending it to the rich agricultural counties in what is called the Kickapoo country. A country of immense extent, with the richest mines in the world, may, by this means, be brought to our doors. We hope, that the committee appointed on this subject, will not let the matter rest, but will at once set about procuring the information necessary to enable their fellow citizens to act understandingly upon it.—[Republican.]

From the London Mechanics' Magazine.

**SELECT COMMITTEE OF THE HOUSE OF COMMONS ON ARTS AND MANUFACTURES.**

(Continued from page 5.)

**MINUTES OF EVIDENCE.**

*Thomas James, Esq., examined:*

The fabrics that I am best acquainted with in our house are silk manufactures; with respect to color, ever since the introduction of French goods, I think we have had a very considerable improvement in the colors, and in the patterns of the English silk manufacture, particularly in the colors—not only in the plainer, which may be called prismatic colors, but in those colors which are creations of fancy, the shades have been much more brilliant than we used to have them. The importation of French silks has almost entirely ceased in consequence of this improvement. The power of producing finer colors on the part of our manufacturers has increased,—as also there has been an increased degree of good taste in appreciating the colors. This improvement has been perceptible since the more free intercourse with France. Referring to Manchester and Macclesfield, the time the country manufacturers came to London, to attend the periodical sales of silk at the East India House, it was their custom to come to our house and other houses of our class, and obtain from us patterns of the shades of different French goods that we had bought or imported, and the imitation of these goods and patterns has led to these improvements, or at least has been co-existent with it. From the excellence and beauty of our fabric, if silk was still to advance and become dearer, the public would always repay that by an increased consumption. The difficulty of selling a bad shade of color, whenever it does occur, is increased considerably on account of the general appreciation of good colors. Until the last two or three years, the production and consumption of figured British silks was a mere trifle, but within the last year the production and consumption of British figured silks has been very considerable. The figures are smaller, and I think more beautiful in form than formerly. Combining the beauty of design with a certain degree of neatness as well in tint as in color, the silk manufactured in England has materially improved. Formerly they were most apprehensive of the figured silks from France, and the content in them was thought hopeless, but there is now executing in Spital-

fields a considerable order for figured silks for America, where, of course, they must meet the French under no circumstances of protecting duty. If, then, the beauty of English manufactured silk goods is so materially improved, from our manufacturers having the opportunity of seeing the French, there is a still greater capability of improvement, if more means of improvement were placed within their reach. I think a matter of the first importance would be to give to the parties who originate patterns a property in the patterns for such a length of time as would repay the outlay and encourage the production of patterns. The Committee is aware that such a protection is given to the printer. When a pattern is framed on printed cotton, the party is protected by the law in the exclusive right of the pattern for three months, and I would suggest that protection should also be given to patterns framed in the loom. It will be in the recollection of the Committee, that some years ago an India handkerchief was almost the distinguishing mark of a gentleman; every gentleman had one in his pocket. India-printed handkerchiefs of very common patterns were sold at from 7s. to 10s. a-piece; now the great consumption of India handkerchiefs is by the importation of the unprinted cloth, and they are printed in this country with English patterns, but the cloths printed in India are now principally sold by hawkers to the lower class of consumers. In our figured patterns we borrow very largely from the French. It is very desirable that we should create an original taste here; we are still behind the French in ribbons and shawls; we borrow our figured patterns from France, in a principal degree. From the decided advantage that we have from China silk, and our application of China silk, I do not fear that we shall decidedly beat the French in figured as in plain goods. I have heard that the French government sent a mission some few years ago into the region of Cachmere, both to introduce Cachmere goods, and also to speculate on the production of Cachmere shawls.

*Mr. Thomas Field Gibson, examined:*

I am a silk-manufacturer in Spitalfields. The description of figured silks which we are now making in Spitalfields are of a very small and insignificant kind; they are not of the large class of patterns. That is, the general class of patterns that are now making. They are almost entirely copies or variations from French patterns; there is but a very small degree of talent employed in Spitalfields in the production of patterns. We are almost destitute of original taste in that particular department. The French patterns are generally given to the pattern-makers by the manufacturers, and they either copy precisely, or make variations, as the manufacturer's or their own taste may suggest. I am not acquainted with any drawer of patterns who is an educated artist. A good pattern-drawer may obtain from 100l. to 200l. a year; but the remuneration varies with the description of pattern. It is also mixed up with a remuneration given for reducing the design to the mould, or cutting the card, which is necessary for the weaving it in the looms. I think that



the two difficulties under which we labor at present, are, first, that we have no protection for patterns, so that if I make an outlay of from 20*l.* to 100*l.* upon a pattern, it may be pirated to-morrow by my neighbor, and I should have no compensation for it; and the second difficulty is, that we have no national taste in this department of art, that we have no originality in design in drawing of patterns, that we are compelled to make copies from French patterns in order to supply the demands of our customers. I think a school of arts open to persons connected with the manufacture of the country would be of high value and importance, coupled with the protection of patterns; but without a protection of patterns, no school of design would be of any advantage to us. It is not to be expected that the master-manufacturers would undertake any part of the expense of such an establishment. The utmost that could be expected from them would be to give their time and attention to the arrangement and working of the system; and I believe the fact is, that in France the government, or the municipal authorities, or both together, do pay for the whole cost of the establishment. If the general taste of the nation was improved, it would be beneficial to our manufactures; and I would add, that ours is a manufacture which is capable of such extreme variety in shades of color, in the blending of shades, and in producing various forms of pattern, that there is hardly any one to which the exhibition of all works of art in which colors are concerned would be more beneficial. A protection for patterns should be for not less than twelve months. I can give a reason why a season or six months would not be a sufficient time. I was manufacturing a pattern in silk during the spring, to the order of a large house of business in London. I received orders from them to continue the manufacture of the same pattern in autumn colors; but in the last month this pattern was taken to Manchester and manufactured there. The order which I had received for the winter article was immediately countermanded, because it was produced at Manchester at a much less price. A heavy fine should be inflicted for piracy. Sometimes there are more than 100 pieces of the same pattern. It more often happens that there are less than 100; more often than not. According to the average return from the Chamber of Commerce at Lyons, the number of pieces made of fancy goods of particular patterns does not exceed 20 from the frame; what is the average production of England of the same manufacture, I have no precise knowledge of—but I should say double, at least 40. In French silks, in some cases, a very large profit is paid to manufacturers on condition that they shall produce a small number, and then destroy the design. A pattern should be protected by registering the actual pattern. With regard to printed goods, the custom is for the parties to print on the end, "engaged for three months," and after that period it may be copied by any body; that would be a sufficient protection if it was extended, as I said before, to twelve months—whatever registration

took place should be a public and authentic one. The registration and location of patterns, representing the state of protection in the particular trade, would be in itself a great means of advancing and improving the manufacture. There are no superior weavers solely employed in weaving patterns, and there is a good reason why this is so; a weaver could not himself produce the pattern to the manufacturer in the same way as he does at Lyons, because in London he is not possessed of machinery by which he could do it; the machinery belongs to the master manufacturer here, but in Lyons it belongs to the weaver. I have heard that in France, after the design has been produced, the weaver introduces a considerable modification into the pattern itself.

*Mr. John Howell, (of the firm of Howell and James, Regent-street,) examined:*

The manner of choosing our patterns or goods is as follows: it is usual for the Lyons manufacturers to come twice a year to England, that is, in the spring for the autumn, and the autumn for the spring, and they produce perhaps 200 or 300 patterns, not paper patterns, but silk patterns or gauze patterns, or whatever it may be, and from these patterns we make our selection; and it sometimes happens that we have so good an opinion of certain patterns, that we say, "Now you must withdraw that, it must be made for us only," and for 20 or 30 pieces they will do that. Now, the English manufacturers never give us that advantage, they think it very expensive to put to work a pattern to show us the effect of it, for it looks so different on paper to what it is in reality, that we cannot decide whether we shall have it or not, and we often urge them to bring us a little piece ready, to see the effect of it; sometimes we want color, sometimes we want a little change in the disposition; but there has always been an objection to the expense incurred, and therefore we are obliged to bear the expense if we are content to order from a paper pattern; we have sometimes found it necessary to ask for a pattern-drawer or designer; not a pattern-drawer, because they are distinct businesses. I never found a good designer in England; a pattern-drawer is a different thing altogether; he is the man who puts the thing comparatively to work, as an architect designs the building of a house. Neither have I found a good pattern-drawer; the designer gives us a small pattern, and the pattern-drawer is the person who prepares the work; as an architect gives a drawing to the builder, so does the designer to the pattern-drawer. I think there are not so many persons that are capable of doing it in this country as in France; the pattern-drawer is the medium between the designer and the weaver. After the peace with France, I found the manufactures of France were superior to those of England; I mean in regard to silks of all descriptions; but I think a great deal of that arose out of having made use of better material; the natural silk of France has been considered better than any other country, but now we have an importation of that natural silk, and it is manufactured here. The importation of raw silk from France, by reason of its su-

perior quality, has beneficially acted upon the English manufacture; I found their silks better the moment I had an opportunity to go and see them; but I have found them declining every day since; every time I go to France, I find the French silks are not so good as they used to be, in point of material and workmanship; they appear to be desirous of a large trade rather than a small good trade; the English manufacture has improved in a great ratio, perhaps, since then. France is superior to us in design, but it is confined to very few houses; there is only one house at Lyons we can deal with largely, because their taste is always superior. I am speaking of design. We keep all our patterns; patterns fifty years old are very useful to us at this present moment. The French pay great attention to pattern shawls; they will give three or four hundred pounds for a Cachmere shawl, or India shawl, for the sake of the pattern. The shawls that were exhibited at the Exposition in France, were superior to the India shawls; the patterns are superior in the manufacture, as well as the combination of colors and design. It is all superior. I believe they have a superiority of machinery in the manufacture and execution as well. Will the Committee allow me to exhibit some pieces of paper, to elucidate the connexion between silk and other materials, the manufactures of the country? It shows how the introduction of good patterns will give a taste or style to other materials; it is intended for rooms in lieu of silks; and instead of costing two guineas and a half, a yard would only cost 2*s.* 6*d.* The inventors are De la Rue and Company, Bunhill-row.—[*Mr. Howell then produced to the Committee patterns of various colors.*]

*Mr. Robert Harrison, examined:*

In designs and patterns in the silk trade we are very inferior to the French; and that is the principal difficulty under which we labor at the present time. We have not been able to find persons in this country who are capable of giving proper designs; the principal difficulty arises from the circumstance of men not having been brought up in this country to design for silk; it is very different to designing for printers, from the circumstance that it is necessary a man should be conversant with the principle of weaving, before he can make a proper design for silk. If we could only get designs in this country, we should be able to find parties that could put them on ruled paper for weaving. There is nothing but what we could make, provided we had a proper designer for the purpose of drawing patterns for weaving; and I think the principal difficulty arises from the circumstance of not having any school of art in this country, where young men would be enabled to pursue their studies for the purpose of perfecting themselves in drawing for that particular branch of the manufacture. There is no want of talent in the country, because there are a great many persons engaged exclusively in the production of designs for printed cottons, challis, and bandannas; we have in the trade individuals who can draw patterns, but are not conversant with the principles of weaving, and therefore we have been



unable to put those patterns to work. We have now many patterns by us which are perfectly useless, because the drawing is not adapted to weaving. We would willingly, at the present time, engage a man at a handsome salary, conversant with the principle of weaving, as a designer, and also able to put the patterns upon paper. Foreigners are not superior to us in their colors; there is a brightness in their colors we certainly do not possess, but I think our colors are more permanent. The dying of colors has certainly improved within the last few years, and in many cases, the permanency of colors decidedly is more so than the French. It is necessary to have a perfect chemical knowledge before a man can be a good dyer. I understand the peculiar brilliancy of the French colors arises from the climate more than any thing else, and the water has something to do with it as well. It has occurred to me, if we had a school of arts established in this country, that a great many young men would be willing to make themselves conversant with the principle of weaving, for the purpose of procuring that particular study, and ultimately to become designers and drawers upon ruled paper for the silk trade. It would be a lucrative profession.

**Mr. George Eld, Mayor of Coventry, examined:**

In consequence of the public attention having been directed to the subject, I made some inquiry with a view to ascertain the number of persons engaged in the ribbon trade, and who had any knowledge of the art of designing in Foleshill; with a population of 7,000, I could not find more than six persons in the whole parish who were capable of copying a pattern, and not one capable of making an original design. At Coventry there is a drawing class connected with the Mechanics' Institution of that town, but it is as yet quite in its infancy. The inhabitants of Foleshill presented a petition to Parliament, in which they prayed for assistance towards establishing a school of design as connected with the ribbon manufacture. I think the operative weavers would eagerly avail themselves of such means of improving their taste and knowledge of art, if those means could be afforded; and I may mention, as an instance of that, that I was conversing one day with a weaver in Foleshill, and stating to him my wish to see the establishment of some school of design in that neighborhood; he said it would be a good thing, and the next morning his nephew waited upon me; he said his uncle had mentioned our conversation to him, and he very much wished that something of the sort should be established. He brought with him some patterns which he had made himself, and was anxious that I should assist in setting on foot something of the sort in Foleshill; a register of patterns; or, in short, to establish a school of design. A mere drawing school would be of very little use, unless it was accompanied by lectures on the art of drawing and design as applicable to manufactures, and as showing the means of transferring the design to the article to be produced.

Are you aware, that, at present, new pat-

terns are invented at Coventry and at Foleshill?—I think very few original patterns are invented; but not being a manufacturer myself, I cannot speak very accurately to that.

You have stated that there is a conviction on the part of the operative weavers that such establishments would be of utility to them?—Yes.

There is a willingness, therefore, on their part, to improve their taste and to acquire a greater knowledge of the arts?—Certainly.

Do you conceive there is any want of native talent, if properly encouraged?—None at all.

In fact, then, in your opinion, it is only doing justice to the natural talents of the manufacturing population to give them the means of acquiring a better knowledge of the art of design?—Certainly.

Do you think, if some encouragement were given by government, or by Parliament, for the establishment of schools of art in certain districts, that local assistance might also be obtained for the same object?—Yes, I think so, certainly.

You think there would be no unwillingness to assist, on the part of the inhabitants of those districts?—I think there would be great willingness.

Have you any public collection of pictures at Coventry or Foleshill?—No, there is none at Coventry, and Foleshill is a mere village, with very few opulent inhabitants.

Then the manufacturing artist has no external means of acquiring a taste in the art of painting?—No.

Is there any museum for patterns at Coventry?—No.

Or of machines?—No.

Is botany a study at all attended to by the manufacturing weavers?—No; there are some collections of natural history, principally of birds, at Coventry; but I have not heard that they have turned their attention to botany at all.

Have they any means of acquiring a knowledge of the effect of a combination of colors?—No.

Is chemistry a science which is at all attended to by the operative weavers?—No.

Is it not attended to by the dyers?—I do not know.

In your opinion is there a sufficient number of opulent inhabitants in Foleshill to establish institutions to promote instruction in the arts among the manufacturing population?—At Coventry, I think, very material assistance could be derived, not only from the opulent inhabitants, but from the established school of that place. There is a school called Bablake School, which is under the patronage of the corporation, in which I think drawing and design, as applicable to manufactures, might very easily be introduced. I think the funds at the disposal of government would very much assist, with the aid of the local institutions, such as Bablake School, in which, if the boys could be taught the arts connected with the occupations in which they are afterwards to be engaged, it would be very advantageous. A central school of art for the instruction of teachers would be very useful, as it would provide for a general direction of the schools. The instructors, taught in

London, from the circumstances of the immensity of the population, the number of public galleries, and the habitual intercourse that exists among individuals of all nations, would certainly have superior facilities for acquiring knowledge in all branches of art.

**Mr. Robert Butt, of the Bronze and Porcelain Department, at Messrs. Howell and James, examined:**

I consider, that, with a few exceptions, in metallic manufactures the French are vastly superior to us in their designs. The exceptions to which I allude are more particularly to manufactures in silver, to gold, jewellery, and to castings in iron, in which I think we excel them in design. In some branches of the porcelain manufacture the French are superior to us in design, in others they are inferior. In that description of porcelain which is of the same nature as the old Dresden china, ornamented with raised flowers, we are vastly superior to them, and a considerable quantity of such porcelain is, I believe, annually exported to Paris, and is sold there, and considered by the French superior to their own; but with the exception of porcelain in which the designs are in relief, theirs are superior to ours. The French are superior to us in their designs in bronzes, and some other metallic manufactures. In the term "bronze," we include not only that which is strictly bronze, but all articles cast in similar metal, whether gilt, or molu, or otherwise, such as human figures, figures of animals, and the ornaments of clocks, candelabra, and so on. The superiority of the English in the one case, and the superiority of the French in the other, is accounted for by the superior costliness of the articles to which I allude in England, as compared with those of France, enabling English manufacturers to give high prices to artists to model or design their patterns, particularly in silver; but with respect to articles of an inferior value, the French are superior to us in their designs, from the greater cheapness of art in that country. In the less costly articles for which art cannot be so highly paid, there is not a sufficient supply of art at a cheap rate for the purposes of the manufacturer. For instance, a silversmith who pays highly for a design, and produces a very costly article, could afford to go to a Flaxman or a Stothard, as artists who could furnish a design; but the manufacturer of articles which come within the range of the less opulent classes of consumers could not afford to employ them. Articles in bronze are of sufficient importance to require the employment of able designers, yet they are not of sufficient importance to demand the assistance of art to be paid for at the same rate as it is for manufactures in silver and such costly materials. I mean particularly to allude to the richer description of silver articles manufactured in England. But similar designs for bronze may be obtained at a much lower rate in France. The reason the iron manufactures will pay for the employment of able designers, and those in bronze will not, is because castings in iron, such as I allude to, that is, for architectural embellishment, have a very extensive sale in this country, and we



have no foreign competitors in that branch of manufacture, but for bronzes there is not an extensive sale, and we have the competition of the French to contend with. I attribute the general excellence of the French in the design of manufactures to the facilities afforded to persons of all classes in France for acquiring a knowledge of the art of design, and the corresponding difficulty to any but persons of comparative independence of obtaining similar instruction in England. The advantage which arises to the French workman from that knowledge of the art of design which the public institutions of France enable him to obtain, consists in the circumstance that he is thereby enabled frequently to make his own designs and models, and if not sufficiently instructed to do that, he is at all events enabled to finish works executed from the models of others with superior accuracy, so to give them their proper articulation and feeling, particularly in human figures and figures of animals. I may say, in continuation, that this is rarely the case with English workmen; and the advantages which the former consequently possess, are conspicuous in the beautiful figures which decorate the clocks, candelabra, vases, &c., which are imported from the continent, the grace and expression of which (however well modelled by the artist) would be entirely spoiled by an injudicious finishing of the muscles, draperies and extremities, by an ignorant workman. Independently of the workmen being instructed, the manufacturer is enabled to get models of great beauty executed at a reasonable rate, which is one of the causes of the great abundance of beautiful designs in France. I am inclined to think that the opportunities which the French have of studying the arts must give a certain tone and feeling for them throughout the country; but I do not know that any superiority in that respect exists among the middle class of France as compared with the same class in England. With respect to the upper classes, I do not think the arts can be appreciated in any country more fully than they are in England. There are very good works in silver filigree executed in this country; as good as Spanish or American, but inferior to the Indian. There is no considerable importation of silver filigree-work for sale. With respect to Germany, the natives are inferior to the French in design, as inferior as we are, or more so, with the exception of the iron works at Berlin. For putting the English manufacturer on an equal footing with the French, I would recommend the establishment of schools of design on a popular plan, which shall be entirely separate and distinct in constitution and management from any of the academies of painting and sculpture now existing in England; and in which it should be distinctly understood that the system of instruction to be pursued would not be intended to qualify the pupils for the professions of painting or sculpture, but merely to teach them the arts of designing and modelling with purity and taste, to be afterwards applied to any manufactures which they may themselves practice, or for the direction of the works of others. Such schools

would operate to improve the manufacturing artist, by enabling young men to acquire a sufficient knowledge of the art of design, to qualify them for the double capacity of clerks and draftsmen or modellers in the counting-houses of manufacturers, who would thereby be enabled frequently to vary and improve the designs of their manufactures without much cost; the great expense of models and drawings by artists being one of the causes of the paucity of design in their patterns at present. I would observe here, that a parallel system obtains in the offices of architects and engineers, where young men are constantly employed in the capacity of clerks and draftsmen. Having gone through a certain probationary study, they are admitted as articulated clerks until they acquire a thorough knowledge of their art, and after a certain time receive payment for their services. It would also enable apprentices in certain trades to acquire a knowledge of design, by agreement in their indentures to attend so many times per week at these schools, so that the study of the manipulation of their trades and the art of design might go hand-in-hand and bring both to perfection. I believe that this system is practised in France. The process by which a knowledge of the arts of painting and sculpture is now acquired in England is this: a young man receives tuition from a private master; he draws from the antique at the British Museum for a certain time, and when he shows that he has sufficient talent to qualify him for a student of the Royal Academy, he is admitted: but the expense of acquiring that preliminary knowledge is considerable, and the young artist must also be maintained by his relatives during the time that he is acquiring it. Open exhibitions of the finest works of all sorts in stone, paintings, bronze, and so on, would have a good effect on manufacturing artists, as giving specimens of the highest works of art. Every school ought to have its museum, the expense of the formation of which would not be great, for casts from the antique statues, busts, vases, candelabra, gems, coins, and so on, would answer the purpose very well. Such a museum ought to be open to the public under certain limitations, to prevent their interfering with the studies of the scholars. There can be no doubt that it would be of the greatest benefit to the manufactures of this country, by improving the taste of minor artists and workmen. The Acts of Parliament existing, for the security of copyright, as far as I know, on the subject of copyright in models or casts from models, afford protection to a certain extent, but the objection is, that they do not go far enough; the protection afforded by the law to models or casts in bronze and other metals extends only to such designs as represent human figures, or figures of animals, or part or parts of such figures. I may state, for example, that however beautiful the design may be, if it be merely a model of *Arabesque* scrolls or foliage of any description introduced into any work, such as clocks, candelabra, &c., there is no protection for it; it may be pirated with impunity.

The copyright in articles which the law

now protects, is, in the first place, for a term of fourteen years, and for a further term of fourteen years in case the inventor be still living at the expiration of the first term, and has not sold his copyright. That is the law at present under the Acts of the 38 George III. chapter 71, and the 54 George III. chapter 56. By the last Act the protection given by the 38 George III. to models of human figures or of animals, was extended to human figures clothed in drapery or otherwise, and combinations of the human figure with parts of the figures of animals, and also to any subject being matter of invention in sculpture. It is very difficult to ascertain the true construction to be put upon the words "being matter of invention in sculpture," but my opinion is, that they would not extend to guarantee the copyright of any model or scroll work, &c., cast in metal, as in the instance of the iron gates of the royal entrance to Buckingham Palace at Hyde Park Corner, which are remarkably beautiful. Now, I apprehend that if casts or impressions were to be clandestinely taken from those gates, and another pair similar in all respects, but with the omission of the royal arms, were to be thereby made and sold, and the proprietors of the model were to bring an action for the piracy, it would be contended that there was no copyright in the design, as it would not consist of models of any part of the human figure or the figure of animals. Moreover, as it could be easily proved that the models of those gates were originally made in wax, clay, or some plastic material, and then cast by the founder in iron, it would be held that there was no sculpture in the matter, and that therefore they could not come within the meaning of the words "matter of invention in sculpture." They might be imitated, provided the King's Arms, which, of course, contains representations of animals, were omitted. This imperfection of the law applies to the proprietor of the model, whether he be the artist, or whether he has purchased it from the artist. By the copyright of a model is of course understood the exclusive privilege of making copies or casts from that model, which a manufacturer may purchase from the artist. The inventor of models which come within the Acts of Parliament as representing human figures or figures of animals, is, I think, sufficiently protected by the present law. I do not consider that the present copyright is for too long a period with a view to afford the inventor a fair protection, and at the same time with a view to the interests of the public, because articles of the nature of which I have been speaking do not sell rapidly; at first the manufacturer will sell but few, and it is only when they become known that he is repaid for his outlay. A provision ought to be made to protect the copyright of models in cases not of an exact copy, but of so near an imitation that one might sell as well as the other; for instance, a figure of Apollo, by altering the posture in the slightest degree, or putting a different drapery upon it. With regard to designs in jewellery, the observation I made as to the additional costliness of articles of silver extend also to jewellery



in England, our designs in jewellery are superior to the French designs. In this case, the manufacturer is frequently his own designer. I attribute the superiority of the English in designs of jewellery to the superior encouragement afforded in England to the manufacture of expensive articles in gold jewellery. In imitative jewellery, however, the French excel us, for there is greater encouragement in France for the inferior classes of ornaments than there is for the real; the propriety of the distinction that I draw between the qualities of the real and imitative jewellery of the two countries may be inferred from the circumstance, that immense quantities of gilt jewellery are annually imported from France, and but little or none in gold.

*Mr. Charles Harriott Smith, Sculptor of Architectural Ornaments, examined:*

My profession relates to the decoration of buildings; the exterior in stone, and the interior in marble; particularly such work as that about the exterior of the new National Gallery, on which I am now occupied; it is that particular department which I principally profess. The capitals and other ornaments, small monuments for churches, ornamented chimney-pieces, &c. There is no difficulty in finding useful assistants, provided I can afford to give them a fair remuneration. The ordinary wages of a clever person, according to his abilities, about 2*l.* or 3*l.* per week. I design myself, but I work a great deal under the direction of architects from their designs. There are no national schools where students can obtain instruction; a few private academies. I have always found workmen who can draw, if ever so little, are more useful, and have the preference. I was going to mention a case in point, that recently occurred to me; I sent my foreman into Yorkshire with work; on his arrival, he found difficulties arose which he had not, nor had I anticipated, and by letter to me, illustrated by his sketches, he explained all that I could wish for. No one but a man conversant with drawings could have done that; similar circumstances are likely to occur to any man in business; and such men obtain, in consequence, higher wages. The workmen have gradually improved, which I attribute to good practice and emulation among themselves; also, the opportunity of seeing works of art, and the opportunity of practising upon works that are likely to improve them. The public demand for architectural ornaments increases, especially in my department. We are most deficient in the true spirit of the Gothic or old English style of carving; but what is strictly called architectural ornaments are more particularly a mechanical process, such as Corinthian and other capitals, friezes of regular proportional parts, &c.; but where trophies, draperies, and those sorts of things occur, they become more decidedly connected with the fine arts. The workmen are, of course, less skilful in that branch than the mere execution of the mechanical part, such as the capitals of Corinthian columns, because it approaches nearer to a work of fine art, and hence becomes more difficult to execute. Wages increase pretty much in the proportion in

which the operative is removed from mechanical labor towards the production of art; those branches that are purely mechanical, and depend much on accuracy of measurement, such as the execution of Corinthian capitals, are done by ingenious common workmen, if I may so term them; when they are employed on work nearly approaching to fine art, which requires more study and mental comprehension, of course the men have better practice, and if they succeed, they demand higher wages, and are entitled to it. I think, that simply in consequence of the improved habits of artisans in my branch of art, it is desirable to give them further means of improvement, since their tendency is to a greater degree of refinement, and that they deserve encouragement by instruction, and opening public places of resort, where they will be made familiar with works of art. I have heard them express a wish to that effect. I have frequently heard them complain of impediments in the way of seeing works of art; and that the museums and exhibitions are not opened after their working hours, and that they have no opportunity of going to them, without not only having to pay for admission, but to lose their time, and of course it thus costs them much more than it does persons in easier circumstances. I think it would be desirable that those collections of works of art, whose influence upon the laboring population would be so beneficial, should be accessible to them at times when they could be visited without any great pecuniary sacrifice on their part. I have always considered that the best means of serving the industrious classes, is to increase their means of serving themselves. I have visited most of the museums in France, and I do not think them superior in designing. The French are more aware of the importance of employing artists to design for their manufactures than the English are. What I have observed as to the comparative merits of the same description of works in the two countries, is this: I think ornaments are as well designed in England as in any country, but the French workmen, collectively, are better educated in art than the English workmen; consequently the French artist has a greater facility of getting his designs well executed than the English artist. The French people, as a body, seem not to be so satisfied with inferior performances as the English are. Whatever deficiency of taste is displayed in our manufactures, arises not so much from want of taste in artists to design and in our workmen to execute, as it does from want of study and education in the arts among proprietors and conductors of establishments wherein classical design and execution forms an important feature. I am also of opinion, that the public, as a body, are not yet sufficiently educated in the arts to discriminate between pure classical elegance and meretricious finery. I am alluding to the public as a body in this country; and the dealers' study is not so much to improve the taste of the public, as to discover what goods will sell most readily, and produce them the largest profit. To mention instances in which our manufacturers giving employ-

ment to artists—Coade and Sealey, the artificial stone-manufacturers, formerly employed some of our most eminent sculptors; among others, the elder Bacon, and Rossi; Rundle and Bridge, the silversmiths, used to employ Flaxman, Stothard, Theed, and Baily, all of whom were eminent in the arts, to design and model for them. Wedgewood used to employ artists of eminence also. At the time they employed these artists they were doing an amazing portion of business. From what cause I do not say, but most of those establishments have changed their system of employing artists of eminence, and they have since employed inferior artists, of course at a much less expense. Whether that is the cause or not, I cannot undertake to say, but their business has certainly fallen off very much; they have now comparatively little or no business of any kind wherein the highest class of artists had been engaged, and the plan appeared to produce the most beneficial results to the proprietors. Works of art are not sufficiently protected, especially those departments of art which are more immediately connected with our manufactures; I mean that which I profess. There is a constant piracy going on, and in my own practice I may allude to it more particularly. It is impossible to protect myself sufficiently from it. Any original drawings or models, whenever I am out of the way, are liable, by workmen or others, to be pirated, and I have no remedy beyond that of discharging an otherwise valuable workman. The copyright of the sculptor, the 38 and 54 of George III., is understood in general not to include ornamental works of architecture; but if a case were to be tried, it would very likely take in all classes of sculpture; but the chance of recovering is too doubtful and expensive. I believe it never has been tried.

(To be continued.)

## AGRICULTURE, &c.

From the Cultivator.

### FARM BUILDINGS AND THE CONSUMPTION OF FODDER.

Among all the deficiencies which exist in the perfect management of our farms, I am sensible that none are more prominent than that of proper buildings. Not that I would advocate expensive or large buildings, but those of ample size and convenience for all the legitimate uses of the farm, and of such shape and construction as shall conform to strictly economical calculations.

For instance, I would not build an expensive stone barn on my farm, when one of wood, equally good for all ordinary purposes, can be erected for a sum not greater than two or three years interest on the cost of the stone one, because a well-underpinned wooden building, where extraordinary warmth and tightness are not required, will endure at least fifty years, and need shingling no oftener than a stone building. So of stables, sheds, outhouses, &c. But not so of dwellings.

The desire of warmth with which human beings are sheltered, forms a prominent part of the comfort and usefulness of life, and therefore, all dwellings should be built



of the best materials, and constructed in the warmest manner, compatible with the ability of the owner. I have much doubt whether the occupant of an open, badly built house, does not pay three times the annual interest of its cost, in the extra fuel and labor consumed to keep its inmates comfortable; and among no class of people have I found so great an inattention to these very important matters, as among our moderate farmers; and when the annual losses by disease, exposure, extra labor of obtaining and preparing fuel, and of time in various ways, all arising from a cold and comfortless house, are taken into consideration, I am thoroughly satisfied that a great portion of the profits of a whole family's industry, are annually lost by the wretched houses they occupy.

The great fault committed by most farmers, in their buildings, is in the great size of their dwellings. Many who build, calculate to do it *within themselves*; or they get out their own timber, draw their own saw logs to the mill, if there be one near them; quarry and haul their own stone, &c. &c., and so manage as to hire but a portion of their mechanic work, turning in their own labor and that of their sons or hired men, if they have them, to assist in its erection. This is as it should be; but the difficulty is, that they often plan too largely, calculating on finishing off only a small portion of the house *at present*, and to do off the rest at some future opportunity of more leisure and convenience. But these future opportunities of leisure and convenience rarely occur, and so much more capital is often expended in the inclosing of a large dwelling than had been anticipated, or is at all useful to the family, that it remains forever unfinished, and a cold comfortless receptacle for them, when a snug, warm and delightful dwelling could be entirely finished, with every requisite comfort for a numerous family, at the cost of the unfinished shell! How painfully true is this fact in numberless instances!

This fatal error oftentimes extends itself to the outer buildings of the farm, alike prejudicial to all descriptions of stock kept upon it, and of most serious account in the year's results of its products. Fortunately, there is so little intricacy or science needed in the construction of farm buildings, that even the least skillful may erect comfortable and necessary shelters for all his domestic animals, and materials abound so plentifully in our country, that they are every where to be found. It is better, even, in my estimation, for a farmer to sell a small portion of his land, to accommodate the remainder with proper buildings, if he cannot do it otherwise, for he is actually richer in the end to do so; as for the most of them, the produce on an equal number of those acres would be annually wasted for the want of them, besides all the discomfort, misery, and suffering caused by exposure to the inclemency of the seasons. This may be unpleasant argument to those who are intent upon nothing but increasing the extent of their farms, regardless of the comforts or profits of their stock. Yet such, were they to pause in their acquisitions, and by the erection of necessary buildings on their farms,

secure more effectually its products, would in a short time accumulate much more rapidly than before. I name these facts with more emphasis, because I am well assured by my observations throughout the country, that the want of necessary and proper buildings is the greatest drawback our farmers experience in the profits of their labor.

Of what avail is it that I reap fifty bushels of wheat, or an hundred bushels of corn to the acre, and lose one third of it for want of shelter, or waste in feeding? Unless I can secure my crop, my profit in growing it is of small account. If I cut fifty tons of hay, and, by exposure in stacks to the weather, only forty of it can be eaten by the cattle, and one quarter part of that even is trampled under foot, I had better have had only thirty tons of good hay in my barn, and even then my stock would have consumed five tons less by being warmly housed for the winter. This is a view of the case which I think must strike every thinking mind, and will apply itself to every kind of domestic animal on the farm. To my own mind it has been most strikingly presented by a year's experience, and I am of opinion that the difference in the consumption of food for the domestic stock of a farm, taking in all the losses incident to the forage itself by want of housing, &c., is at least *thirty* per cent., compared with the most economical method of expending it; and in some cases even *forty* or *fifty*! I am aware that this calculation will strike the reader with surprise, and by many it will not be believed; but to such I only say, try it, and he will become satisfied of its truth.

In the spring of 1834, the management of a large tract of land coming under my charge, portions of which had for years been most miserably mangled by a horde of squatters, who had cut, haggled, and worked the land after their own fashion, although abundantly productive by nature, I found it in a most miserable condition, requiring immediate care and attention. Numerous wretched log cabins were scattered over it with bark roofs; an occasional shed for cattle, with a parcel of old rails thrown over the top, and on them the remains of an old stack bottom, where their hay, stalks, or straw, had been stored, were all the buildings or conveniences to be found on the premises. Three or four of these little squads or settlements had been made on different parts of the territory, and each one comprised within its compass from one to two hundred acres of this partially cleared, girdled and dilapidated improvement. Having got rid of the squatters, and selected one of these settlements most conveniently located for immediate operations, and taken the best cabin, well situated and convenient for a dwelling, I put into it a good family, fit to manage the place, built an addition to it also of logs, put on a good shingled roof, and with a hundred or two dollars expense, made a very comfortable affair of it. With sufficient help on the place, the fences were straightened and put into line, the old bouks, (*bocks*), brush fences, logs, &c. &c., cleared up and tolerable crops got in. Having come into the place about the middle of April, it was too late in the season to make

rapid advances, but in the course of the summer perhaps 30 acres of oats, 5 or 6 of corn, and as many of potatoes, were cultivated, and yielded a tolerable crop. A dozen acres of wheat were also sown in the fall, and perhaps 70 or 80 acres of land worked into tolerable shape for another season. Yet we had no barns nor the means of building any during that year; one wretched log stable, which stood near the house, was all that we had for shelter to any of our animals, and with that we shifted to get along. Our hay, of which we had some 60 or 70 tons cut from a distant clearing, our oats, corn, fodder, &c. &c., were all stacked out in the open air. Winter came upon us. With a few thousand feet of boards and the aid of crotches and poles, we made some sheds and mangers for our cattle, of which we had a large stock, composed of oxen and cows, and erected some racks in the yard to feed them in. By these means we got through the winter, after the fashion. Our cattle had enough to eat, and during the cold weather, looked tolerably well: but as the cold rain and snow storms of March and April came on, they grew poor in spite of all we could do. Food enough to keep in high condition double their number, if well housed, was given them, but all to little purpose. The storms wet the fodder in the stacks, the cattle trampled it into the mud under their feet, and with all the care given them, which was a great deal, I am fully satisfied that at least 25 per cent. of the food given them was entirely lost!

And yet this was better and more economical feeding than one half the stock of our country get on the average! It may be a bold and sweeping remark, but it is nevertheless a *true* one, and would every farmer make the experiments who thus practises, he would fully test its correctness. We had great labor to perform, and therefore submitted to the loss and inconvenience accruing to this mode of management. During the winter, we cleared up more of this *slashed* ground, inclosed it, drew off its wood and timber, and last spring had perhaps 200 acres of pasture, mowing and plough land ready for use. We were now ready to build a barn, and after the spring crops had been put in, proceeded to erect one proper for the uses of the farm. It was soon built, covered and inclosed, and by haying and harvest time was ready for use. It was placed on a central and convenient spot for the farm, which is a large one, and although this barn is 100 feet long, by 50 feet wide, and 18 feet posts, with lean-tos for stables on each side of it, with a floor 14 feet wide, lengthwise through the centre, more room will soon be required. It was a matter of much wonder and inquiry by my neighbors who saw the barn, of what possible use it could be, supposing it a most extravagant building, although, for the size, a very cheap one. Yet when we had cut and stored our hay, oats, and wheat, the barn was crammed full to the roof, on the floor and all. We housed every thing; all was put in, in perfect order and good condition. Ample room is there made to tie up every animal to be fed, and not a lock of hay or a spoonful of grain need be lost. The manure is all saved, and in a



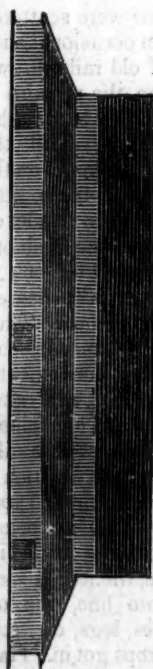
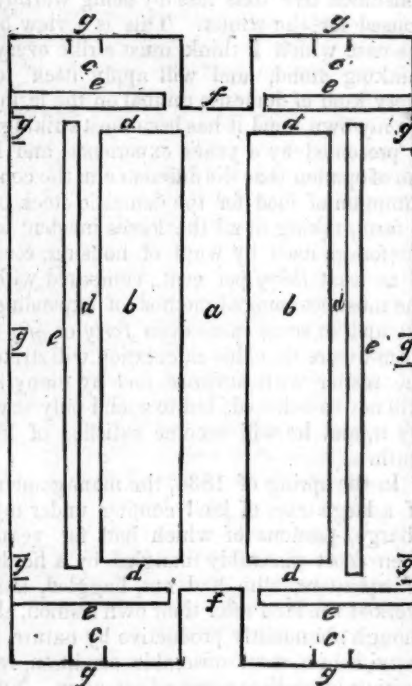
convenient situation to be carried out, and a degree of economy, comfort, and satisfaction experienced in expending the food to the stock, that amply compensates for all the extra expense. The hay and grain it contains is more than 150 tons, enabling us to feed out every bundle of straw and coarse fodder, which is in most cases altogether lost, or only used for manure: a plan of this barn is annexed.

There are so many collateral subjects connected with the barn and other outbuildings of a farm, that it is hardly possible to give an essay on this subject, without discussing the different methods and economy of feeding stock, with the preparation of the food, preservation of manures, &c. &c. But as the principle of feeding is the same in all kinds of neat cattle and horses, it will apply to all cases. In the first place, I hold that there is no straw, corn, fodder or grass cut on a farm, with the exception, perhaps, of the straw of peas, beans and buckwheat, but what may be consumed as food; therefore all reasonable pains should be taken to secure them in good order, and have them well stored and sheltered for winter food. How many thousand tons of valuable wheat straw have I annually seen in our wheat counties thrown out from the threshing mills, and piled up year after year to rot and taint the atmosphere with its offensiveness, when it might all be made into the best of food for cattle, by being housed and chopped with trifling labor! It appears with many farmers to be a matter of no sort of consequence *who* feeds the stock, or *how* they are fed, provided they are only fed at all; not considering that there is equal economy in expending the food as in securing it. Look at the season of haying and harvest among our farmers. What preparation for toil and incessant labor, increase of help, high wages, &c. &c. Up by day-break in the morning, and at work, and no rest till dark. It is the extraordinary season of the farmer, when every thing is sacrificed, even the Sabbath, oftentimes, to toil, and no cessation till it is all over. But when the winter comes on, this invaluable food, collected at so much cost and toil, is expended with a heedlessness and prodigality unaccountable to any rational or thinking mind. This, indeed, may seem foreign from the subject of which I am treating, but it is too nearly allied to it to be lost or overlooked.

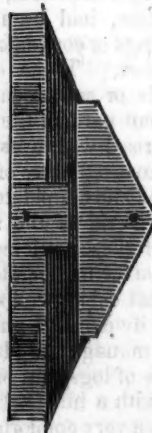
My own method of feeding is to cut every kind of straw, and even the coarse marsh or meadow hay, in the cutting box, and mix it with a light portion of shorts, bran or oat meal, just enough for the cattle and horses to eat it. In this way they consume every thing. Nothing is lost; for what they leave is taken from the mangers and mixed over again with the new mess. It is the exclusive business of one man to cut the food, clean the stables, and feed the cattle: and if he needs assistance, he has it. By this means he becomes acquainted with the appetite and health of each animal, a matter altogether important. If they be out of health, or need extra nursing or attention, he knows it, and provided for them. A change of food is occasionally given, and by this operation all is relished

and eaten perfectly clean. We now feed about 40 yoke of oxen, 8 or 10 horses, 6 dozen cows, some sheep and young stock, all in this manner, though not all in one building, without any waste at all. Every thing is saved. Every animal is tied up in its place excepting the sheep, and each has its own portion without fear or molestation. I well know that they consume less food per head by thirty per cent. than they did during the last winter, when they were fed nearly, if not quite equal to, the ordinary method practised throughout the country. Our oxen, I am satisfied perform more labor, the cows yield more milk, and all the animals consume less food by being thus housed and attended. But to the plan of the barn. It is here given.

Ground Plan.



Upright—Side View.



Upright—End View.

Explanation.

a, barn floor, 14 feet wide.

b, b, bays for hay and grain, 18 feet wide and 92 feet long.

c, c, stables for cattle and horses, 13 feet wide in the clear.

d, d, passages to stables, 4 feet wide.

e, e, mangers for feeding, 2½ feet wide.

f, f, great doors, 14 feet wide.

g, g, stable doors, 5 feet wide, double.

Length of barn, 100 feet.

Width of do. 50 do.

Posts of do. 18 do.

Pitch of roof, 12½ feet.

Height of leanto posts, 7 feet.

Pitch of stable roof, 8 feet.

Length of side leantos, 100 feet.

do. end do. 38 do.

The barn is framed as if to stand alone, omitting the lower girt at the ends on each side of the large doors. The leantos are then framed on to the barn in the simplest manner—the passage being round the main body of the barn, excepting at the ends, where the passage is in the main barn, and the leantos there only 16 feet wide, and the manger is fitted up to the main barn. Only one passage is made to go into the short stables at the ends. Stalls are made 7½ feet wide and broad between, and each ox or cow is tied next to the partition side of the stall, which prevents their getting together, and saves much room. The doors are sufficiently wide to drive in a pair of oxen yoked, and large spikes are driven in the plates all round the stables to hang harness, yokes and chains upon.

The bottoms of the mangers are raised ten inches from the floor, and laid double. The sides of the stable are also battened with thin boards inside, which makes them perfectly tight and warm; windows with sliding shutters are made in the sides, to throw out the manure.

Girts run parallel with the main floor in the posts, across which are laid poles, nine feet above the floor, on which hay or grain can be piled up to the peak.

This barn will hold 200 tons of hay and 46 yoke of oxen, or 100 cows or horses. If only ordinary stock is kept, the long leantos need be only 18 feet wide, and the short ones 14 feet. Granaries can be partitioned off from the bays or stables, as may be convenient. If a threshing machine is used, a part of the stable can accommodate it. Its whole expense, finished complete, is about \$1,500.

On this model, barns of any size may be built, and I am well satisfied that, according to the room required, it is altogether the cheapest in cost and simplest in construction of any plan I have seen. If a less proportion of stable room be needed, it may be omitted where convenient.

The passages around the ends of the bays and in front of the mangers, are for feeding the cattle, every thing being put in front of them. The passages are wide enough to carry hay, and when the bay is partially fed out, the hay may be thrown directly into the passages.

I would on no account store hay or other material over the cattle, under the stable roofs, although there is considerable room, as I am satisfied from experience, that there is none too much space left for ventilation.

The floors are lined with thin refuse



boards, excepting a part of the stables, it being my wish that *nothing be lost*.

This barn is placed on level ground, having no side hill convenient on which to place it. I would prefer, if possible, a sloping piece of ground, and make an ample cellar beneath it, to receive the manure, preserve roots, &c. &c. It will add to the expenses of building, but greatly to the convenience and economy of the farm.

This, it is true, is on a larger scale than is needed for an ordinary farm; yet many farms require as much and a larger quantity of barn room. If every thing be saved and housed that can be profitably expended in the feeding of stock, much more shelter is required than is supposed. If the farm be small, the size of the barns should be graduated to its wants. This plan has been closely examined by many farmers of great experience, and pronounced to be the best they have seen. The utmost possible economy of room is made for packing the hay and grain, and the stables are mere lean-tos, made of light frame, attached to the sides and ends of the main building. If wood covering for either of the sides or roof of boards and shingles are not to be obtained, they may be made of thatch. The bodies of the building may even be laid up of logs and covered with slabs, so that they be well chinked and comfortable. It is true that there is some waste room over the cattle in the stables, but no more than is wanted for ventilation and to pass off the respired air, which is deleterious to their health. The letting in of fresh air in cold and stormy weather, through the sides of the building, gives them colds and disease, to which they are as liable as the human family. But even if only sheds are wanted, I am satisfied that they are better to be attached to the sides of the barn in the way these stables are, than in any other, being more convenient, and allowing the stock to be fed in them with greater economy. The stables attached to this barn being for the accommodation of working cattle mostly, are wider than need be for an ordinary stock, and may be made narrower. But amongst all other plans, I have found none which combine the requisites of cheapness, economy of feeding and storage, like this. It has, withal, an appearance of snugness and comfort about it that greatly embellishes the farm.

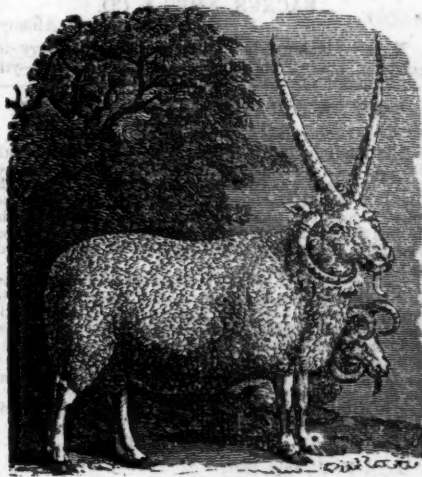
If sheds are wanted in addition, they can be attached to the stables and run off in either direction, and accommodated with racks and mangers, as may be required. But every domestic animal on the farm should be fed at the barn, with the exception of sheep, which require, if kept in large numbers, a different and separate course of management. The custom of stacking hay or grain in the fields is at best a bad one, and if resorted to, it should be removed to the main barn as soon as the cutting season is over, or there is room in the barn to receive it. Small moveable barns are frequently built to store it in, and from them fed to cattle during the winter: but this, in the best of weather, is accompanied with waste, particularly in the manure, which is valuable even on the best of soils. It is, besides, much less labor to carry the hay

either on sleds or wheels to the barn, and then feed it to the stock, than to go daily two or three times to fodder it out. So much has been said and written on the wasteful method of feeding at stacks, that at this time it is almost superfluous to mention it.

As to the other ordinary outbuildings to the farm, it is only material that they be conveniently and economically built. No farm house should, however, remain without a swill house, with a large cauldron set in brick, an ample wood house, wagon and tool house, corn-crib, &c., near by. As to the dwelling, it is a matter of fancy with many, and to those who have the ability, provided they make it comfortable and convenient, it matters little what is the shape, size or style of it. Still there is a model that I consider cheaper and more convenient than almost any other, and for those landholders and farmers who build for the accommodation of their tenants, I consider it a most excellent one to follow. I am about building one on a farm of my own for the manager to live in, sufficiently capacious to accommodate his own family and half a dozen hired men. Its whole expense will not exceed a thousand or twelve hundred dollars, and if opportunity offers, I may send you the plan in some future communication.

Most truly and respectfully yours,  
L. F. ALLEN.

Buffalo, December 5, 1835.



From the Cultivator.  
POLICERATE SHEEP.

Mr. BUEL:—Sir,—Having in my possession a variety of sheep, which are not very common in this country, I have procured a likeness of the oldest buck, engraved by Mr. Hall, of this city, who I think has done himself great credit in the execution.

I obtained three bucks and nine ewes, in October last, from a farmer in Bethlehem, who procured the buck figured above, some five or six years since, from which he bred several bucks with four horns. The breed was originally procured, as I have been informed, from some emigrants. I esteem them more for their odd and singular appearance, than for any intrinsic value they appear to possess.

The specimen represented above, is remarkable only for his horns. The upright ones measure, from the base, twenty-two inches.

Buffon says, "One of the curious modifi-

cations produced by cultivation in the domesticated sheep, consists in the augmentation of the number of its horns; two, three, or even four supplementary, appendages of this description being occasionally procured in addition to the usual number. Under these circumstances, the additional usually occupy the upper and fore part of the head, and are of a more slender shape and take a more upright direction than the others, thus approaching in character to those of the goat's while the true horns retain more or less of the spiral curve that distinguish those of the sheep. There exists a strong tendency to the hereditary propagation of its monstrosity, which is extremely frequent in the Asiatic races, but is also met with in a breed that is common in the north of Europe, and is said to have been originally derived from Iceland and Ferroe Island. In the latter case it is unconnected with any other anomaly; but in the flocks of the nomad hordes of Tartary it is usually combined with the enlargement of the tail and adjacent parts, by the disposition of fat frequently to an enormous extent."

In the islands of the Archipelago, and chiefly in the island of Candia, there is a breed of sheep of which Bellon has given the figure and description, under the name of *Strepsicerus*. This sheep is of the make of our common sheep; it is, like that, clothed with wool, and only differs from it by the horns, which are larger and rise upwards, but are twisted into spirals. The distance between the horns of the ewe enlarges towards their tops; those of the ram are parallel. This animal, which is commonly called the Wallachian sheep, is frequent in Austria and Hungary, where its name is Zacke.

The more cold districts of Iceland and Russia afford a many horned breed of sheep, of mostly from four to seven or eight; having a coat of dark brown colored hairy wool, weighing about four pounds, and covering an inferior quality of short soft fur.

In Cyprus many of the sheep are policerate, (having more than two horns.) They all spring from the frontal bones, the crest of which is elevated in a peculiar manner, in order to form their base. The central horns are usually straight, or somewhat divaricating—occasionally they are spiral; the lateral ones assume almost every possible variety of curve. A cut representing one of the most frequent appearance of the Cyprus four horned sheep, is figured in the "Library of Useful Knowledge—Farmer's Series."

CALEB N. BENNET.

Albany, Jan., 1836.

**BELL ROCK LIGHTHOUSE.**—During the heavy gales of the month of October, the sea, for this early period of the season, broke uncommonly high upon the lighthouse, the foundation of which is immersed to the depth of the full rise at every tide. The light-keepers, in their monthly report (ascertained by the position of the perspective windows of the house) state, that the sea rushed up the walls to the height of from 60 to 70 feet, on the 5th and 6th; to 80 feet on the 11th and 12th; and to 70 feet on the 26th. On these occasions, the green seas collapse the lower part of the building, when sprays, as white as snow, shoot up, and in their fall, as seen from the balcony, produce effects truly sublime. To the mariner, passing at a safe distance from the rock, the lighthouse and its inmates cannot fail to suggest reflections somewhat awful. But habit has so trained the light-



keepers to this scene, that it excites no alarm, and in their monthly return, they go on with a detail of having caught a number of the birds which in storms constantly flutter about the light, and sometimes break the plate-glass windows. On the 23d, an immense flock of marrets and other sea birds occupied several hours in passing the lighthouse in their flight from the northward in the direction of the Isle of May, in the Frith of Forth. So uncommonly numerous were they, that it is supposed they must have been turned by stress of weather in their migratory flight.—[Montrose Rev.]

**RAILWAY PHENOMENON.**—On Monday last a gentleman of this town, who had taken his place in the hindmost carriage of one of the railway trains from Bolton to Kenyon, witnessed the following singular occurrence:—He was placed with his back to the engine, and had a clear view of the receding line of railway. The train was going down the inclined plane from Baglane to Leigh, at the apparent rate of from 30 to 40 miles per hour. A man who was standing on the side of the railway threw a stone about the size of a hen's egg in a horizontal direction, and with considerable violence, at the train. The stone was distinctly seen by the gentleman in its progress to the carriage in which he was seated, and, having attained its maximum of velocity, it appeared, like Mahomet's coffin, to be suspended in the air for a few seconds, within a foot of the gentleman's head. He seized hold of it, and he describes the sensation which he felt in doing so as somewhat similar to that which would be felt in grasping a stone, in a state of rest, suspended by a thread.—[Bolton Chronicle.]—[This is easily accounted for; both the train and the stone had attained the same velocity.—[Manchester Adv.]

#### NOTICE TO CONTRACTORS FOR EXCAVATION AND EMBANKMENT.

Proposals will be received at the Office of the Munroe Railroad Company, Macon, Geo., between the 19th and 21st of May next, for Excavating and Embanking the whole of the Railroad from Macon to Forsyth, a distance of 25 miles, embracing much heavy graduation.

For further information, apply to

**DANIEL GRIFFIN,**  
Resident Engineer.  
**J. EDGAR THOMSON,**  
C. Engineer.  
11—5t

Macon, March 28th, 1836.

#### ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

**WILLIAM V. MANY** manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9-ly

#### ARCHIMEDES WORKS.

(100 North Moor st. N. Y.)

NEW YORK, February 12th, 1836.

The undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

**H. R. DUNHAM & CO.**  
4—ytf

#### SMITH & VALENTINE,

STEREOTYPE FOUNDERS,

Are prepared to execute orders in their line,

at 218 Grand street, New-York.

#### TO BRIDGE BUILDERS.

Sealed Proposals will be received, until the 15th of April, for finding materials and building the superstructure of a bridge, over Harlem Creek and flats, on the New York and Harlem Railroad.

Said Bridge to be on the late improvement of Mr. Town, 24 feet wide in the clear, and 660 feet long between the abutments, to be supported by three piers of masonry. The bridge to be completed by the 1st of Nov. ensuing. Communications may be addressed to the undersigned, at his office, No. 9 Chambers street, where plans and specifications may be seen.

**JOHN EWEN, Jr.**

Engineer of the New York and Harlem Railroad.  
9-t15a

#### TO CONTRACTORS.

NOTICE is hereby given to all persons who may feel disposed to take Contracts on the Illinois and Michigan Canal, that the Board of Commissioners have determined to commence that work as early in the spring as circumstances will permit. The Engineers will commence their surveys about the 10th of March, and will have several Sections ready for contract by the first of May. It is therefore expected that definite proposals will be received from that date to the first of June. In the mean time the Board invite an early inspection of that part of the route to Chicago, and will afford any information that may be required of them.

All communications will be addressed to "The Board of Commissioners of the Illinois and Michigan Canal, at Chicago."

By order of the Board.

**JOEL MANNING, Secretary.**

January 20, 1836.

8-6t

#### AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens Ames' superior back-strap Shovels

150 do do do plain do

150 do do do cast steel Shovels & Spades

150 do do Gold-mining Shovels

100 do do plated Spades

50 do do socket Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed), manufactured from Salisbury refined Iron—for sale by the manufacturing agents,

**WITHERELL, AMES & CO.**

No. 2 Liberty street, New-York.

**BACKUS, AMES & CO.**

No. 8 State street, Albany.

N. B.—Also furnished to order, Shapes of every description, made from Salisbury refined Iron. 4—ytf

#### PATENT RAILROAD, SHIP AND BOAT SPIKES.

The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

**HENRY BURDEN, Agent.**

Troy, N. Y., July, 1831.

Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes.

1323am

H. BURDEN.

#### RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS.

Also, Flange Tires, turned complete.

**ROGERS, KETCHUM, & GROSVENOR.**

#### STEPHENSON,

Builder of a superior style of Passenger Cars for Railroad.

No. 264 Elizabeth street, near Bleeker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlem Railroad now in operation.

**THE NEWCASTLE MANUFACTURING COMPANY**, incorporated by the State of Delaware, with a capital of 200,000 dollars, are prepared to execute in the first style and on liberal terms, at their extensive Finishing Shops and Foundries for Brass and Iron, situated in the town of Newcastle, Delaware, all orders for LOCOMOTIVE and other Steam Engines, and for CASTINGS of every description in Brass or Iron. RAILROAD WORK of all kinds finished in the best manner, and at the shortest notice.

Orders to be addressed to

**Mr. EDWARD A. G. YOUNG,**

Superintendent, at Newcastle, Delaware.

feb 20—ytf

#### PROPOSALS

#### FOR THE REPUBLICATION OF THE REPORTS OF THE BALTIMORE AND OHIO RAILROAD COMPANY;

Condensed so as to include, together with other matter added thereto, all that is known at the present day of the location and the application of Motive Power and Machinery thereupon, accompanied with explanatory drawings. The whole being intended to serve as a Manual of the Railroad System, for the use of Civil Engineers, to which is prefixed a history of the Baltimore and Ohio Railroad Company.

The work, whose reports it is thus intended to republish, was the first of any extent commenced in this country for the purposes of general transportation; and its early history is but a series of experiments, costly to the Company which had it in charge, but furnishing results of the greatest value and importance to others. The character of the country through which the road passed, involved every species of excavation; and in the construction of the Railway, almost every mode was successively tried for the purpose of ascertaining the best. While portions of the road were straight, others were of the smallest admissible curvature, and the locomotive power employed had to be such, therefore, as was suitable to both cases. This led to a series of experiments in this department of the Railroad System, which has resulted in the production of Engines preferable to any in use elsewhere—equal in speed to the best imported, and far superior in efficient power. From all these circumstances, the reports of the Baltimore and Ohio Railroad, from its commencement to the present day, have been sought for by Civil Engineers for the sake of the knowledge which they contain, and the frequent demand for them has suggested to the subscriber their republication, with such additional matter as shall constitute a Manual of the Railroad System in the present state of knowledge on the subject.

The reports are now difficult to be procured, and but few complete sets are known to be in existence. While the proposed republication will therefore be of use to the profession of Civil Engineering, it will be the means also of preserving the records of a work whose importance and value are now universally appreciated. The work will be divided into five parts.

I. History of the Baltimore and Ohio Railroad Company.

II. The location of Railroads, including the principles of reconnaissances, general instrumental surveys, and location for construction.

III. The construction of Railroads, including the excavation and masonry and the construction of the Railway on the graduated surface, turn-outs, weighing, &c.

IV. The motive power including engines, cars, wagons, &c.

V. Forms of contracts for every species of work which has to be performed in the construction of a Railroad.

As it is not practicable to ascertain what sized volume or volumes the contemplated work will make, the price cannot be fixed, but Railroad Companies and individuals who may subscribe for it, may rest assured, that it will be made as reasonable as the nature of it will permit. Orders directed to

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